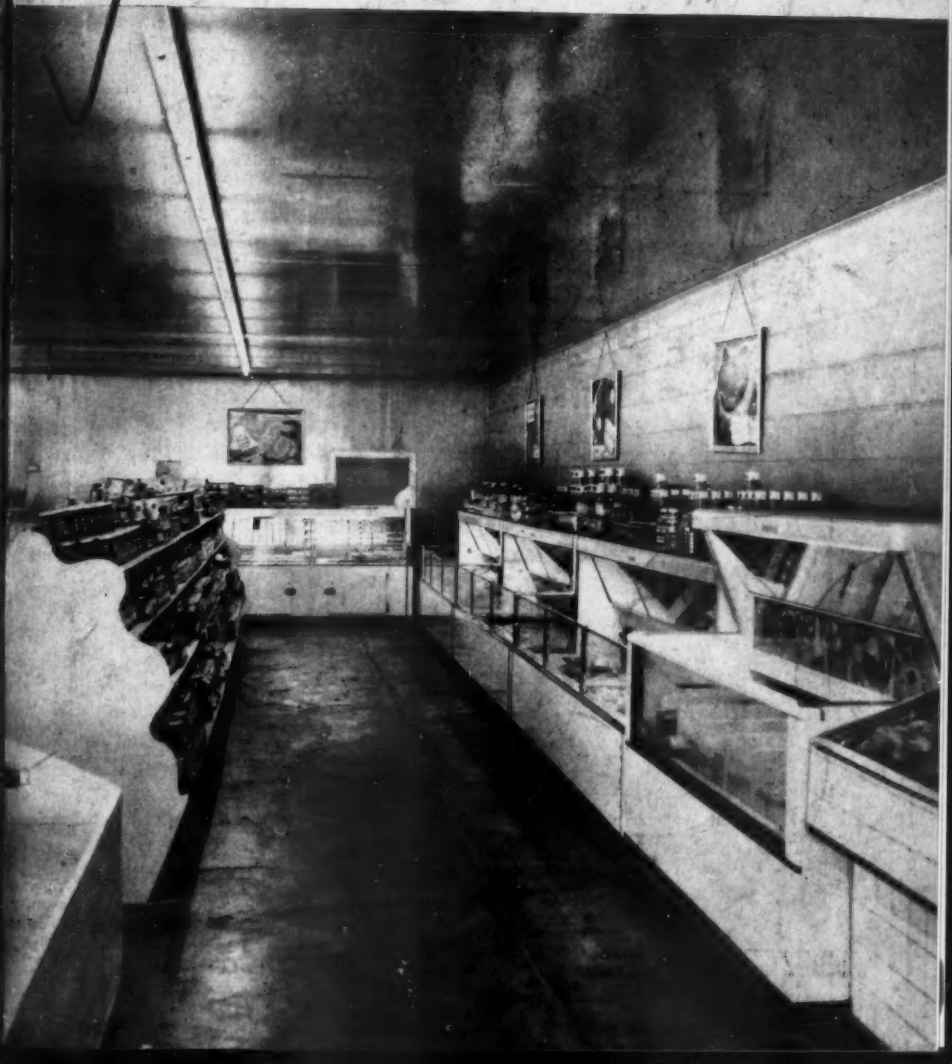
Refrigeration Service Engineer

VOL. 16 NO. 2 ★ ★ ★ FEBRUARY · 1948



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IDEAL "THERMO-GRIP" SOLDERING SET

Here you see the best heating device for sweating and unsweating threadless copper tubing. Note how the tube connecting the condenser to the compressor is easily and quickly formed and sweated to the fitting with an Ideal "Thermo-Grip." The "Pliers" grip the work, leaving the other hand free to handle the solder.

This is just one of the many soldering jobs that can be done faster, safer, and better with "Thermo-Grip" *instant heat.* Economical too—conserves power . . . draws current only when actually being used and in contact with the part to be heated.

The Ideal "Thermo-Grip" operates on the resistance heating principle, *concentrates heat,* and can be used for long periods without overheating. It's modern in design, light weight, portable. All parts fully insulated . . . current reduced to harmless low voltage . . . no fire hazard. Thumb-switch permits close heat control.

This unit is adaptable to all types of soldering jobs with "Plier," "Pencil," and "Fork" Attachments. Ideal Industries, Inc., Sycamore, Ill.

ASK YOUR WHOLESALER FOR NEW BULLETIN FORM TGB-947, OF PARTICULAR INTEREST TO REFRIGERATION SERVICE ENGINEERS

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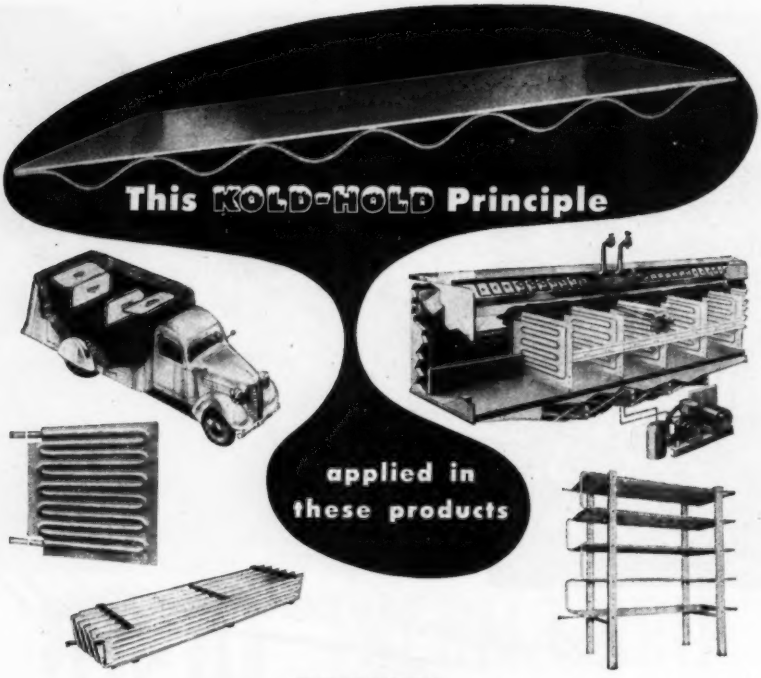

means PROFITS for you

KOLD-HOLD "Quick Action" Serpentine Plates have a multitude of applications . . . all profitable to the user. Used to equip new installations, or to convert outdated ones . . . used separately, in banks, plate stands, or as cabinet liners, they assure you the following advantages:

1. Easy installation.
2. Maximum prime surface.
3. Highest rate of plate heat acceptance.
4. No possibility of short circuiting the flow of refrigerant, which flows in one continuous pass from inlet to outlet.
5. Oil logging positively prevented.
6. Minimum pressure drop.
7. Tested under pressure.
8. An appreciably higher "K" factor.
9. Thoroughly cleaned and dehydrated.

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KOLD-HOLD MANUFACTURING CO.,

PROCESSING TRANSPORTATION
protects every step of the way
STORAGE

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HERE!..The New GE Line of Condensing Units

Greater sales appeal and easier installation and maintenance were two of the most important considerations in the designing of General Electric's new line of condensing units for the commercial refrigeration field.

Including units from ⅛h.p. to 1½ h.p., the new line features eight air cooled models and 4 water cooled models. This line actually meets the commercial market's requirements with a maximum capacity range integrated in three basic compressor sizes—*many vital parts of which are made to be interchangeable!*

In this new condensing unit line, G. E. has embodied many big condensing unit features that mean greater assurance of long life, dependability, lower-than-ordinary operating costs, and lower installation and service costs. Learn more about them by contacting your G-E representative today! *General Electric Company, Air Conditioning Department, Section C8122, Bloomfield, New Jersey.*

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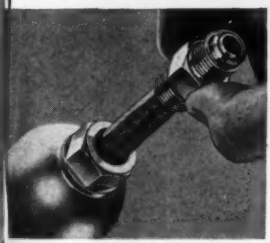
Refrigeration Equipment

IMPERIAL
TORPEDO® DRIERS

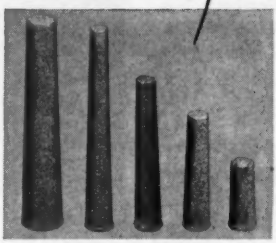
. . . designed for faster, more efficient drying action

. . . for longer operation without cleaning



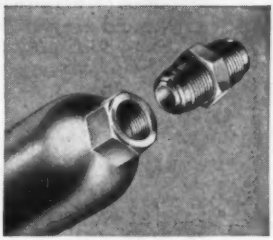
EASILY REFILLED ON THE JOB

Two generous wrench holds, one on inlet fitting and one on shell, make it easy to open drier for refilling. No bolts to unscrew . . . no flanges or springs to remove. No soldering required after refilling.



GRADUATED FILTERING AREA

Size of metallic depth filter is graduated with drier capacity. This assures ample filtering area on larger units. Element is composed of innumerable small bronze particles fused together in a controlled atmosphere.



INTERCHANGEABLE CONNECTIONS

30, 50 and 75 cu. in. sizes have female flare threads on both inlet and outlet which are fitted with male flare unions. To change size, simply replace union furnished with reducing union of desired size.

A complete line to meet all refrigeration applications. Capacities rated in accordance with REMA recommendations. All eight sizes—1/6 to 7-1/2 HP . . . 3 to 75 CU. IN. capacity—are furnished complete with flare nuts and copper seal caps.

Ask for your copy of the new Catalog No. 80 covering the complete IMPERIAL LINE.

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Fittings • Valves • Driers • Filters • Floats • Charging Lines
Tools for Cutting, Flaring, Bending, Pinch-Off and Swedging

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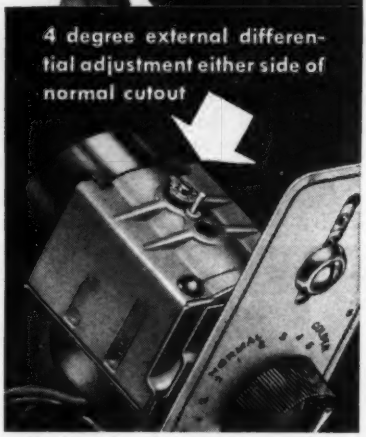
FOUND IN THE CUTLER-HAMMER REFRIGERATION REPLACEMENT LINE

Sixty percent of all refrigeration control replacement requirements are met by one Cutler-Hammer control alone . . . the *Universal* Replacement Unit. And where specific control is needed, that need is met by Exact Replacement control items in the C-H line, each individually packed, clearly labelled, complete with dial plate mounting screws, trim washers and full instructions for mounting and adjustment.

The practical advantages gained are: less capital tied up in stock; rapid and regular turnover; speedier completion of each job; greater all-round satisfaction. And in each C-H Replacement unit you will find the results of a 50-year specialization that had led to acknowledged leadership in the control field. Thus, outstanding refrigeration wholesalers recommend C-H Replacement Control and alert service organizations everywhere feature and use it. CUTLER-HAMMER, Inc., 1363 St. Paul Ave., Milwaukee 1, Wisconsin.



Bul. 9521N9 ➔

THIS ONE UNIVERSAL UNIT ALONE COVERS 60% OF ALL NEEDS

ADJUSTABLE MOUNTING BRACKETS

Maximum Mounting Centers 4-3/16

Minimum Mounting Centers 2-3/16

Adjustable Cutout Feature—Differential can be increased 4 degrees by turning indicator in "Hi" direction and decreased 4 degrees by turning in "Lo" direction.

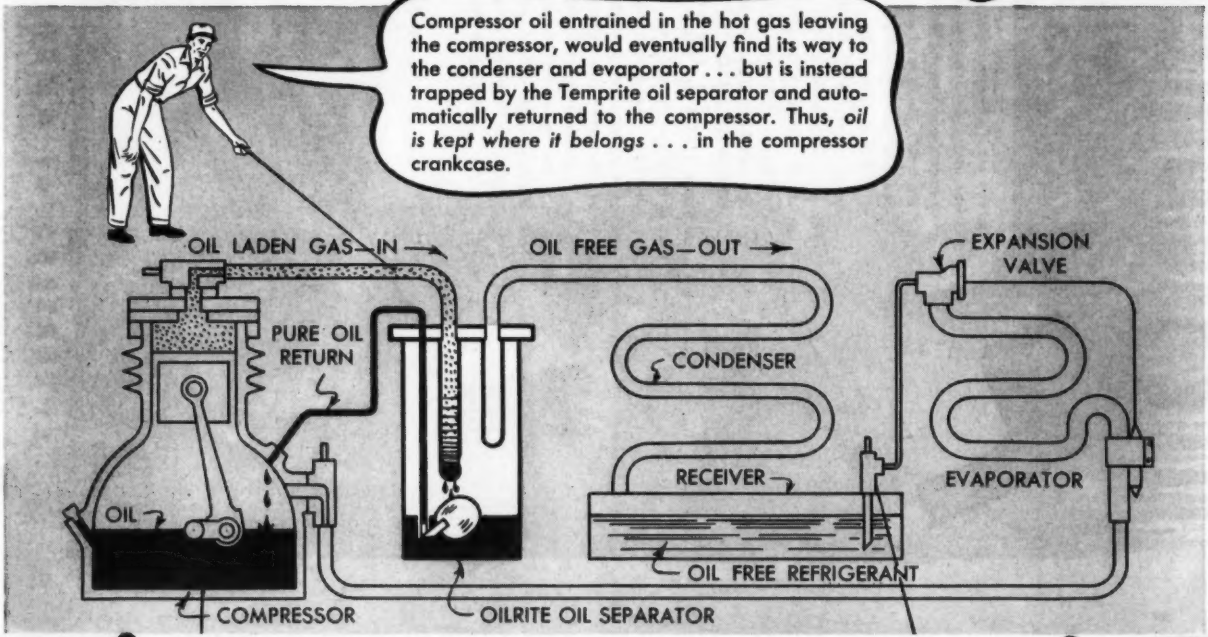
Adjustable Range—Turning screw clockwise lowers setting and counter-clockwise raises settings.

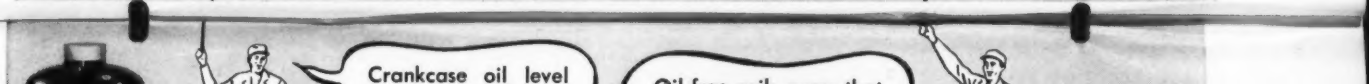
Operating knob can be adjusted to meet various evaporator scale settings. New knob is ideal for varying shield thicknesses. Makes *this* control adaptable to wider range of single dial replacement jobs where overload is not required in unit.

CUTLER-HAMMER
MOTOR CONTROL
C-H

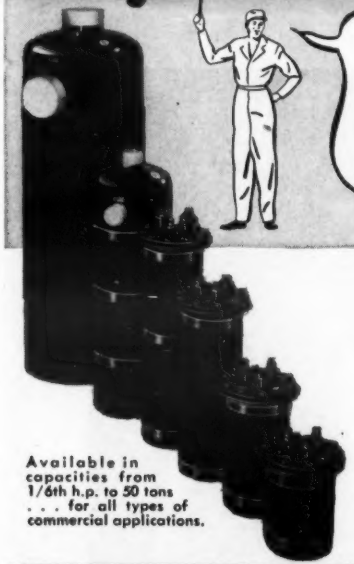
DOMESTIC, SEMI-COMMERCIAL AND COMMERCIAL CONTROL

Keep oil where it belongs...





COMPRESSOR — OILRITE OIL SEPARATOR



Crankcase oil level remains constant at all times, eliminating danger of scored cranks, wrist pins or cylinders.

Oil free coils mean that the refrigerant boils at its true boiling point and heat transfer is frequently increased as much as 15 to 20%.

Available in capacities from 1/6th h.p. to 50 tons . . . for all types of commercial applications.

...with a TEMPRITE oil separator

Oil congeals quickly in low temperature coils, cutting down heat transfer and boosting operating time. Because of this common difficulty it is frequently impossible to reach desired temperatures. A Temprite Oil Separator overcomes this problem and permits the refrigerant to boil at its true boiling point. Temperatures from 4 to 7 degrees lower are easily reached at no increase in operating time.

Write now for full particulars.

TEMPRITE PRODUCTS CORP.

ESTABLISHED 1929

Originators of Instantaneous 80° 40° *Liquid Cooling Devices*

45 PIQUETTE AVENUE DETROIT 2, MICHIGAN

Action photograph
Reaming 1/4" to 7/16" in steel plate
f32 at 1/5000 sec. Electroflash
Impact Tool fitted with No. 2 Morse Taper Socket and 7/16" tapered reamer.

- Applies and removes nuts
- Drills
- Reams
- Taps
- Drives and removes screws
- Drives and removes studs
- Extracts broken cap screws and studs
- Runs wire brushes
- Does hole saw work
- Drills brick and masonry
- Drives wood augers

Uses standard attachments

● What other electric tool would permit you to ream 3/16" of metal from a steel plate held in your hand!

The amazing Ingersoll-Rand Impact Tool (the only universal electric rotary *Impact* Tool in the world) is easy to hold . . . you get no torque reaction—no kick—no twist—under any condition. A patented mechanism converts the power of the electric motor into "rotary impacts" (1900 per minute) which exert a more powerful turning effect than is produced by any other electric tool of comparable size.

AMAZING! — Even if you stall the spindle completely the motor continues to run—no burned out motors when you use the Impact Tool.

AMAZING! — You need only one (1) Impact Tool and standard attachments to perform all of the operations listed.*

AMAZING! — Delivery from stock . . . See your nearest Jobber or Distributor.

Ingersoll-Rand

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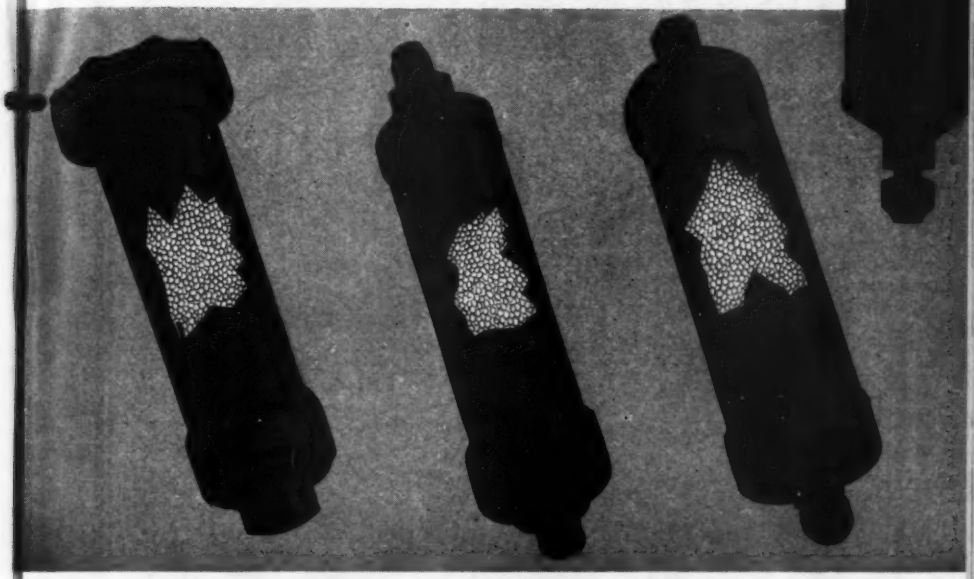
Specify S/V Sovabead for your Dehydrators



New Type Silica Gel Desiccant in Bead Form Offers Many Advantages

● You can be sure of maximum moisture adsorption when you get S/V Sovabead in your dehydrators.

Controlled laboratory tests show that these new beads, developed by Socony-Vacuum, are capable of reducing the moisture content of Freon 12 Refrigerant to as low as .0002 of one percent.

What's more, the uniform beads offer less resistance to the flow of liquid and gaseous refrigerants than other desiccants. You get less dusting and attrition loss.

So make certain of a superior desiccant next time you order dehydrators. Specify this new bead type desiccant from your supplier.

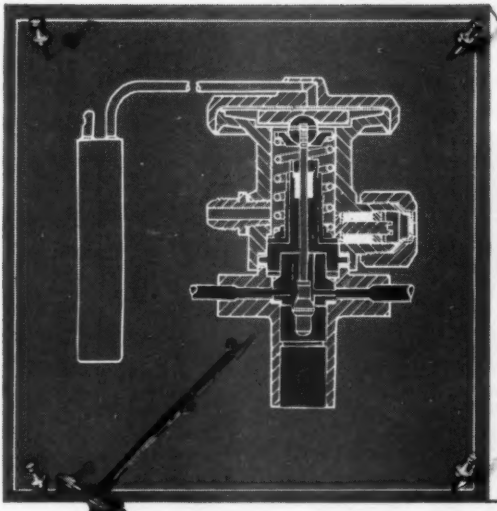
This table shows maximum drying effects of desiccants obtained in tests conducted by an independent laboratory. Standard dehydrators containing the activated desiccant were flooded with wet refrigerants and analyses were made after at hourly intervals.

REFRIGERANT	DESICCANT	INITIAL MOISTURE	AFTER 1 HOUR	AFTER 2 HOURS	AFTER 3 HOURS
"Freon 12"	S/V Sovabead	0.0060	0.0008	0.0006	0.0002
"Freon 12"	Silica Gel	0.0060	0.0008	0.0006	0.0002
Methyl Chloride	S/V Sovabead	0.0160	0.0029	0.0025	0.0020
Methyl Chloride	Silica Gel	0.0160	0.0029	0.0025	0.0020

Socony-Vacuum Process Products

SOCONY-VACUUM OIL COMPANY, INC., 26 Broadway, New York 4, New York,
and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

Process Products
SOCONY VACUUM

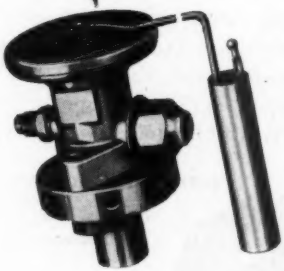


ALCO

MULTI-OUTLET

THERMO VALVES

for even refrigerant distribution throughout the circuits



The liquid refrigerant is accurately metered at the point of expansion to all evaporator circuits. Equal distribution is accomplished before pressure reduction causes the separation of gas and liquid.

The Alco Multi-Outlet Valve, in thousands of installations, has improved coil capacities up to 25%.

It is simple in construction and provides stable control under all load conditions. Equal distribution is maintained regardless of superheat changes.

Your wholesaler can supply you with the proper Alco Multi-Outlet Valve: available for ½ to 50 tons FREON-12, 2 to 36 outlets. Ask for our Bulletin 180.

Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves; Float Valves; Float Switches.

ALCO VALVE CO.

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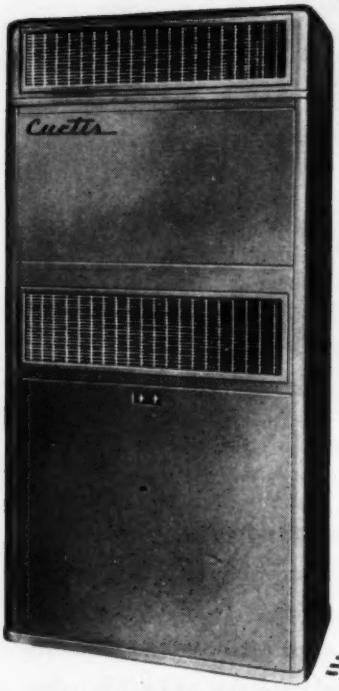
..Offers More to You and Your Customers

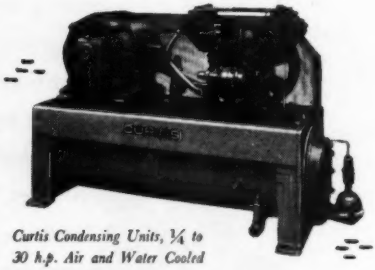


Curtis Packaged Air Conditioner, Capacities 3, 5, 7½, 10 and 15 tons

For commercial refrigeration or air conditioning applications the complete Curtis line offers more to your customers — in satisfactory, trouble-free performance, sound, proven design and engineering and lower operating and maintenance costs. Curtis advantages include:

- Timken Bearings
- Extra large condensers
- Slow operating speed — quiet performance
- The Finest Materials — Precision Construction
- Long Life
- Full range of sizes and capacities

You'll sell more, make more profits when you sell Curtis. Write for full information today.



Curtis Condensing Units, ¼ to 30 h.p. Air and Water Cooled

CURTIS REFRIGERATING MACHINE DIVISION

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94 Years of Precision Manufacturing

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- Greater Customer Satisfaction
- More Ranco Controls in Use
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- More Profit for You

Ranco O-1401 Low Pressure Control, for applications requiring differentials of 6 lbs. or more.

You Be the Judge!

Examine a Ranco Type "O" Control carefully . . . notice, particularly, the use of selected, quality materials and the precision engineering of every detail of design and construction. You be the judge . . . then you'll *know* why Ranco Type "O" Pressure Controls provide dependable, trouble-free service, and why there are more Ranco Controls in use today than any other make. Your Ranco wholesaler will be glad to show you the complete line of Ranco Pressure Controls, designed to meet the most exacting requirements.

Ranco Inc. COLUMBUS 1, OHIO

World's Largest Manufacturers of REFRIGERATION CONTROLS

THE REFRIGERATION SERVICE ENGINEER

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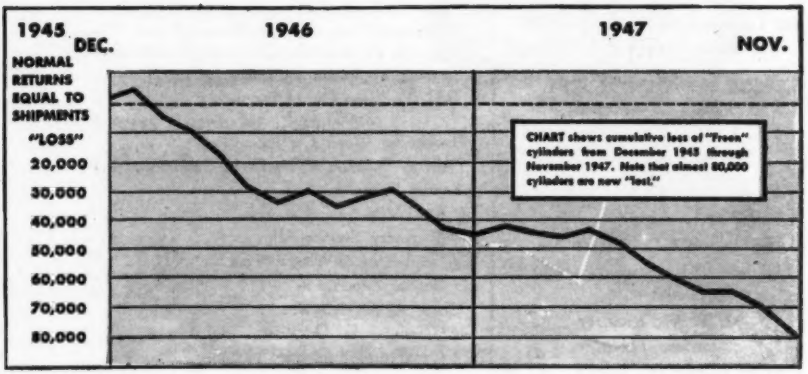
Contents

"LOST" 80,000 "FREON" CYLINDERS



Since December 1945 — when return of empty "Freon" cylinders equalled shipments—there has been a consistent shortage in returns. Today, that shortage has reached the alarming total of approximately 80,000 cylinders!

To continue shipping "Freon" to meet your current, spring and summer requirements . . . these "lost" cylinders *must* be returned to the "Freon" plant—NOW.

Only *you* can help ease this serious shortage. How? By looking around your premises NOW . . . by checking every cylinder *and* by returning every empty "Freon" cylinder immediately. Today, if possible.

New cylinders are still in short supply, and only returned empties can bridge the gap. So take time out—now—to return every empty "Freon" cylinder. Full deposits will be refunded immediately.

Ship empty "Freon" cylinders to: Kinetic Chemicals, Inc., Carney's Point, N. J. Specify P.R.S.L. as the carrier.

Kinetic Chemicals, Inc., Tenth & Market Streets, Wilmington 98, Delaware.

KINETIC
FREON
REG. U. S. PAT. OFF.
safe refrigerants

IN THIS ISSUE

REPORTS OF RSES CONVENTION AND ALL-INDUSTRY EXHIBITION

AS WE go to press with this issue, the 10th Annual R.S.E.S. Convention and the 5th All-Industry Refrigeration and Air Conditioning Exposition are still in progress in Cleveland. Preliminary reports indicate a very successful meeting, however, it was not possible to get details in this issue. A full coverage story and pictures of all events will be included in the March issue.

THE electric motor, though it is one of the most sturdy and important components of the refrigerating machine, is too often abused beyond its ability to take it. It is often selected to do a job it was not designed to do; it is often overloaded beyond its normal capacity and when it groans and quits under abnormal conditions is is often slighted in the amount and kind of work done on it. Much of this is due to a lack of understanding of the individual natures of motors and it is with the thought of promoting a better understanding that A. H. Barrere writes his article, "The Importance of Proper Care for Electric Motors," beginning on page 31.

NUMEROUS questions on the possibility of replacing "Freon-12" with "Freon-22" as a means of increasing capacity or of correcting some ills in the refrigerating system has led Ed Asproth to write his article, "A Practical Comparison of 'Freon-12' and 'Freon-22,'" appearing on page 37. As the title implies, it provides a more practical understanding of the difference between these two refrigerants.

APPEARING on page 41 is the last article in the series "Take the Guess Out of Estimating" by Donald F. Daly. In this last article he discusses Warranty Service, how various contractors handle the costs on commercial installations, and two methods of handling the costs in the average sales and service or distributor organization.

THE chart on delivery practices in the ice cream industry appearing on page 46 shows that a large percentage of cabinets in past years were loaned to dealers without any rental charge.

ONE of the Service Pointers appearing on page 47 of this issue tells how to build a drill vise out of scrap parts around the shop. It is a useful tool if you have a drill press to go with it.

IF A CUSTOMER complains that the capillary tube is noisy, what can you do about it? The answer to that is included in one of the questions and answers starting on page 49.

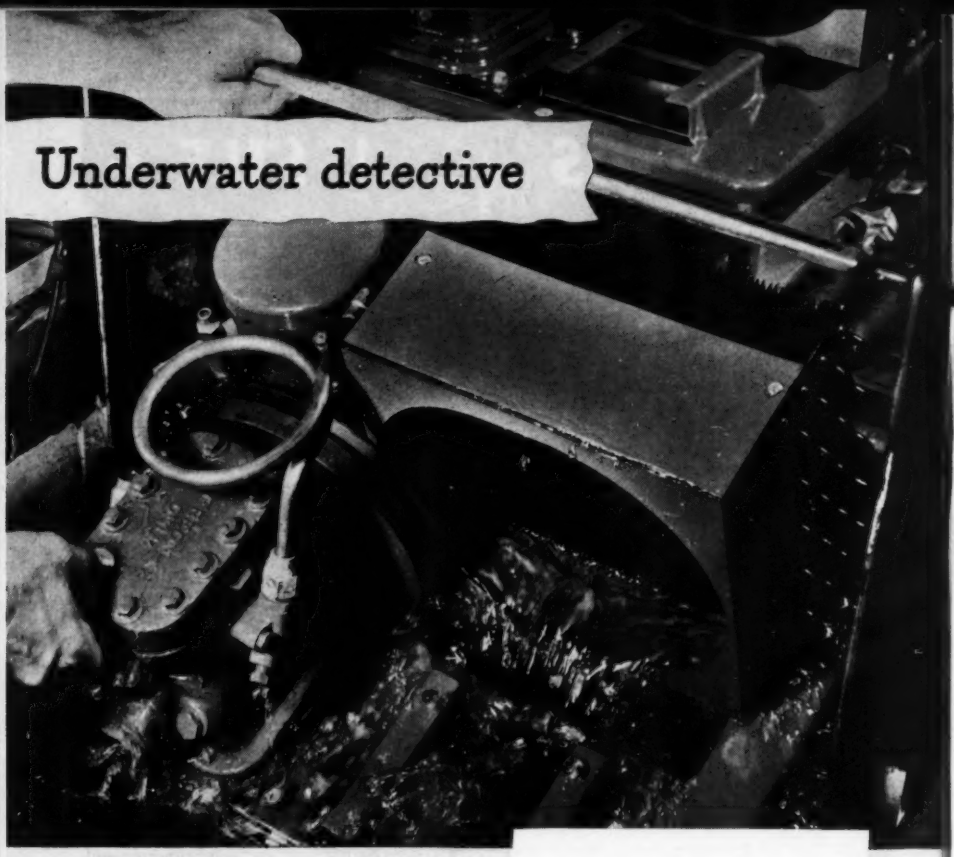
SHIPMENTS of air conditioning and refrigerating equipment show a decrease in the Bureau of Statistics report for the third quarter of 1947, appearing on page 50.

COVER

INTERIOR view of Kelso's Superette Market in Coffeyville, Kansas, using Hussmann Refrigeration, Inc. self-service cases. This equipment was sold and installed by the B-K Fixture Company, of Coffeyville. Both members of this firm were formerly of Tulsa, Okla., and are members of the Oil Capital Chapter of the R.S.E.S. This is the first complete self-service store in southeastern Kansas.

Walter Brandborg and J. R. Keefe were engaged in refrigeration service work in Tulsa, Oklahoma, for many years prior to forming the B-K Fixture Company and moving to Coffeyville to be near their territory which consists of the six counties in the southeast corner of Kansas.

Underwater detective



Better condensing units
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Mass Precision

To assure you of an absolutely tight condensing unit, throughout, Jack & Heintz gives it a final test by submerging it in hot water where pressure bubbles indicate the slightest leak. Add this to a score of tests applied individually to the compressor, condenser, receiver and other parts and you have one of the reasons why you can rely completely on J & H units.

The high precision of these tests is typical of every Jack & Heintz operation . . . to make sure that you get the best products that money can buy.

JACK & HEINTZ PRECISION INDUSTRIES, INC., *Cleveland 1, Ohio*

Electric Motors · Ball Bearings · Refrigeration Compressors · Electronic Magnetos · Aircraft Starters · Aircraft Generators · Aircraft Inverters

The Importance of proper care for

Electric Motors

BY A. H. BARRERE, JR.*

I HAVE written this paper with one thought in mind, that is: to stress the importance of the electric motor. It is a piece of machinery that has played an important role in the growth of our great country and it will and must continue to do so, because, without electric motors in their various types and forms, it would be almost impossible for this country to survive, as we are dependent on them for our daily existence, but, like all things that are plentiful, you gentlemen of the refrigeration service industry have become too complacent in your attitude towards the electric motor. This is caused by the fact your interest is in the refrigeration system to such an extent that it causes you to lose sight of the most important factor, the electric motor, which furnishes the driving power for the equipment you service.

You must remember that the successful operation of the equipment you service depends and revolves around its source of motive power which is the electric motor, and if all operating conditions are not satisfactorily met, the electric motor cannot be expected to give trouble-free service.

I am of the opinion that if each and every one of you would devote some time each day towards becoming more familiar with the operating characteristic of the electric motor, and the various conditions that cause motor failures, that in a short time you will eliminate the majority of costly callbacks you are now receiving, because nine times out of ten the condition which caused the motor to fail on the callback was also responsible for the first breakdown.

Of the various types and classifications of electric motors the refrigeration service man comes in contact with, the following are the most popular, as they are used almost exclusively on all domestic as well as commercial installations: Repulsion-Induction Motor; Condenser-Start Motor; Split-Phase Motor; Shaded-Pole Motor; Three-Phase Squirrel-Cage, and Slip-Ring Motor.

The first four types are single phase motors, and provided the horsepower rating is not too high, they can be operated from the conventional outlet in the home. In cases where the horsepower is too large for the regular lighting circuit, then it is necessary to have a separate circuit from the distribution cabinet to the motor terminals to take care of the heavy current large single phase motors draw.

The importance of good service for electric motors cannot be overemphasized. It is with this thought that the author of this article describes the characteristics and application limitations of the six different types of motors which may be found in refrigerating equipment.

The Three Phase Squirrel-Cage motor is used on commercial installations almost exclusively with the exception of large units which use the Three-Phase Slip-Ring motor. Both of these types require a three-phase power supply to operate on.

In order to more fully understand the use and applications of the various types of motors, let us start with the Repulsion-Induction motor, which is commonly called a R.I. motor.

The R. I. motor is a constant-speed heavy duty motor suited to general purpose applications requiring high starting torque, such as refrigeration or air compressors, water or gasoline pumps, or any other application requiring the motor to start under full load.

May I add a word of caution at this time, that is, all R. I. motors will not prove satisfactory for refrigeration service. This is due to their design which limits these motors to

* Russell Electric Co., Inc., Mobile, Alabama. Paper presented before Alabama R.S.E.S. State meeting.

intermitting or light duty service only, and their use is limited to such applications as cellar drain pumps, washing machines, tools for the home work shop, etc.

The R. I. motor has a stator winding which is connected to the line, and an independent armature winding. This armature winding is in principle much like the secondary winding of a transformer. The coils of the armature winding are connected to the bars of a commutator which is mounted on the armature shaft. The armature coils are short-circuited at the commutator by means of the carbon brushes which are normally connected together by a flexible piece of wire.

When voltage is applied to the stator winding, this winding induces a current in the armature coils, and at the same time reacts against the induced flux, causing the armature to rotate as the speed increases a short circuiting device; which is also mounted on the armature and operated by a governor assembly; connects all the commutator bars together when the armature reaches approximately 75% of synchronous speed so that the motor can operate as an induction motor.

The reason an R. I. motor must have a short-circuiting device, is that at no load the motor would continue to increase its speed to a dangerous degree.

Condenser-Start Motors

The Condenser-Start Motor also has high starting-torque and constant speed, and it is used on the same applications as the R. I. motor. However, in the last few years this type of motor has found wide usage on domestic and small commercial applications, not only because of their overall efficiency and quieter operation, but because of their lower initial manufacturing cost and simplicity of construction.

To substantiate the growth in popularity of the condenser-start motor, a majority of the motor manufacturers have discontinued manufacturing R. I. motors under ½ horsepower.

The stator of a capacitor motor has two windings, a main or running winding and a phase or starting winding. The starting winding is in series with an electrolytic condenser and a stationary switch. The rotor has large copper bars in the laminations which are brazed together on each end, making a solid ring. On this rotor is mounted the centrifugal switch.

When current is applied to this type of motor, both running and starting windings are across the line, and as the speed increases to approximately 75% of synchronous speed, the centrifugal switch opens the stationary switch, disconnecting the starting winding from the line.

The Split-Phase Motor is similar in construction to the condenser-start motor with the exception that it does not use a condenser in the starting circuit, and it has a lighter starting winding. This motor is strictly a light duty motor designed for use on such applications as washing machines, ironers, hair dryers or any other piece of equipment not requiring a motor starting under full load.

The Shaded-Pole Motor has very little starting torque and is used where the power requirements of the drive are small. They range in size from approximately 1/15 to 1/250 horsepower and are used on small fans, toys, instruments, etc. The rotors are similar to the condenser-start and split-phase motors; however, the stator has only one winding. It obtains its starting ability by a short-circuited ring of copper or similar metal embedded off center in the pole piece. This ring obtains an induced field, delayed in magnetic timing in relation to the main winding to produce a starting torque.

Squirrel-Cage Motors

Three-Phase Squirrel-Cage Motors are simple in construction as they do not have any governor or switch mechanisms to contend with. They have a rotor similar to the condenser-start and split-phase motor and a stator winding. The squirrel-cage motor is highly dependable, reliable, and economical. There are three basic types which are as follows:

Normal-Starting-torque, Low-starting-current

High-Starting-torque, Low-starting-current

High-starting-torque, High-slip.

Of these three types only the first two are found in your type of service work.

The normal-starting-torque, low-starting-current squirrel-cage motor is the most popular and was designed for general-purpose applications.

The high-starting-torque, low-starting-current motor was developed principally for automatic compressor applications where high-starting torque with magnetic control and full-voltage starting was desired.

The Slip-Ring motor has a stator wind-

ing but instead of the solid rotor such as used in the squirrel-cage motor, the rotor has a winding similar to the stator winding. This winding is connected to a set of collector rings and by the contact of brushes on these collector rings this winding is connected to an external controller. This controller is used for starting the motor at slow speed by inserting a resistance in series with the rotor winding, and as the rotor accelerates this resistance is gradually cut out so that when the motor reaches full speed the collector rings are shorted together and the motor runs as a squirrel-cage motor.

The starting torque of a wound-rotor induction motor depends upon the value of the external starting resistance. A starting torque approximately equal to the breakdown torque of the motor can be obtained by using the proper value of starting resistance.

There are other types of motors which you may encounter in your service work. These I have omitted because of their rarity or special application.

Causes of Failure

We, or the repair industry, are often asked the question: What are the contributing factors in motor failure? This is a difficult question to answer, as any one or combinations of several of the following factors, which are the most common, can result in motor failure.

Low Voltage
Motor on overloaded circuit
Motor out of alignment on machine
Belts too tight
Improper lubrication
Using the wrong type of motor on application
Motor not protected by proper over-load protector
The individual who attempts to do his own repair work

I wonder how many of you refrigeration service men have the necessary instruments for checking voltage and amperage when you make a service call? You would not think of going on a job without your pressure gauges and thermometer, yet the checking of the voltage and amperage is just as important to the successful operation of the complete unit as is the vacuum and head pressure, because should you find a motor drawing more than its rated amps at normal voltage, this is a sure indication of an overloaded condition which can be caused by bad motor bearings, belts too tight, or compressor trouble.

Upon checking the voltage at the motor terminals if you find it to read low while the motor is in operation, there are two things to look for:

One, the circuit that the motor is connected to may not be of sufficient size to carry the current and therefore causes an excessive voltage drop, or other appliances may be connected to the same circuit which will reduce the voltage when all are running at the same time.

Second, there may not be full voltage at the service entrance. In either case this condition must be corrected before you may expect the electric motor to function properly.

I wish to call your attention to the fact that a 10% reduction in voltage is equal to approximately 20% loss in horsepower. This statement, no doubt, will bring up the question, "Why won't the motor operate satisfactorily at a 10% drop in voltage, as most manufacturers state their motors will operate on voltages 10% above or below nameplate rating?"

Voltage Variation

The manufacturer's statement may hold true in appliances other than refrigeration work, and as far as the voltage being 10% above nameplate rating this is swell, but I have found from experience in servicing motors used on refrigeration equipment, that almost every manufacturer of refrigeration compressors leans towards underhorsepowering a unit rather than over-powering, and for this reason the motor manufacturer's statement that his motor will operate satisfactorily on voltage that is 10% below the rated nameplate does not hold true.

The majority of fractional horsepower motors manufactured today are designed for operation on 115/230 volts instead of 110/220 volts. The higher voltage rating of these motors has contributed its part towards motor failures, though the percentage of increase in voltage rating is low.

As an example, throughout most of the large cities, the power companies are using a four-wire, 208-volt distribution system and most single-phase service to homes and small commercial users has a three wire entrance; whereby by the proper connection you will receive 115 or 208 volts. Now, should the motor of the 115/230 volt rating be connected to operate on the lower or

115 volt service, you can be assured of good operation as you have full voltage, but, if for some reason you have to connect the motor to operate on the higher voltage, the motor calls for 230 volts for satisfactory operation. However, the incoming service is only 208 volts to begin with, which is approximately 10% lower than the nameplate rating, and in most applications this percentage is higher due to the voltage drop in the circuit which runs from the distribution panel at the service entrance to the motor terminals. So you can readily see how the higher voltage connections of these motors can develop into costly warranty work, not only to the refrigeration service man but the electric motor repair shop as well.

If the service man is on his toes when a condition such as this prevails, he has two alternatives for correcting this particular source of trouble:

One, and the least expensive, is to find out if the line from the distribution panel to the motor terminals is heavy enough to carry the current the motor would draw on the lower or 115 volt connection and should it be of sufficient size, it should be changed over to the 115 volt service.

Second, and more costly, is to have the motor rewound for operation on 200, or 208 volts if a motor of this voltage rating is not available.

Avoid Long Extension Cords

Another factor that does its part in causing motor failures in domestic appliances, is that the owner of the appliance, in not having a suitable or convenient outlet, runs an extension cord made out of No. 18 fixture wire all over the house before reaching the motor terminals. This is a very dangerous practice, not only from the harm it can do to the motor by reducing the line voltage, but the ever-present fire hazard as this type of wire was not designed to carry heavy currents.

The motor alignment on any piece of equipment is very important because a misaligned motor will cause excessive bearing wear and shortens belt life, should the application be belt driven. Yet every day motors come into our shop showing positive indications of misalignment, and service men continue to disregard this factor.

Belt tension is another troublesome problem. If the belts are too loose, they will slip on the motor pulley when the motor starts, which decreases the life of the belt. Should the belts be too tight they cause an overload on the motor, and due to the increase in friction between the bearing and bearing journal, the temperature of the motor is increased, which will cause the lubricant to thin and lose its body. When a condition like this is allowed for any length of time, the motor will develop bearing trouble and possibly cause the motor to burn up.

Another cause of bearing failure is improper lubrication. This applies to ball bearing as well as to sleeve bearings.

Lubrication

In general, two methods are used to lubricate Sleeve Bearings. One method is known as the wick type oiler system. The wick type oiling system provides a circulation of oil by means of a wick in one form or another, drawing oil from the reservoir by capillary action up to and over the top of the sleeve bearing.

The wick type of oiling system provides a very satisfactory and reliable system of lubrication for small motors, provided the proper oil is used. Some certain oils have been found to disintegrate the wick. If too heavy oil is used it will not flow through the wick freely enough to provide adequate lubrication. Therefore, it is highly important to use only an oil which is recommended by the motor manufacturer.

The other method of oiling is known as the ring type oiler system, and is used for larger motors which require a larger quantity of oil circulation for cooling as well as lubricating the bearings.

The following recommendations, if carried out, will assure proper lubrication and long bearing life:

For wick type oiled sleeve bearings in motors from 1/250 to 1/15 horsepower. These extremely small fan motors are designed to have very little starting torque. Unless an extremely light or thin oil is used the motors will not start, particularly when they are cold. Even some highly refined oils develop, by oxidation, gummy products which make them unfit for this service. Use only mineral oils which are extremely thin and have a viscosity not exceeding 75 seconds at 100 degrees Fahrenheit, a pour point of 30 degrees below zero, and contain an inhibitor which prevents dangerous oxidation.

Oils which are recommended for larger sleeve bearing motors are absolutely unsatisfactory for these small motors.

On motors of 1/10 to ½ horsepower, a good grade of automobile engine oil of S.A.E.-10W. viscosity is recommended.

Motors of ¾ through 3 horsepower use a good grade of automobile engine oil of S.A.E.-20W. viscosity.

For the ring oiler type sleeve bearing the following oil is recommended. Motors rated under 5 horsepower use a good grade of automobile engine oil S.A.E.-20W. viscosity.

Motors rated 5 horsepower and larger, use a good grade of automobile engine oil S.A.E.-30 viscosity for normal operating temperatures. When motors of this size operate in an abnormally high room temperature approximating 90 degrees Fahrenheit, use a good grade of automobile engine oil S.A.E.-40 viscosity.

By all means *do not use animal or vegetable oils* and *do not fill the oil reservoirs when the motor is running.*

Ball Bearing Motors

Motors equipped with ball bearings require the same care as sleeve bearings, and if given the proper kind of treatment they will give long years of continuous and trouble-free service.

Over greasing of ball and roller bearings quickly shortens the life of the bearing, and this factor is responsible for a large majority of bearing failures.

Ball and roller bearings are usually in a sealed enclosure called a cartridge. When a cartridge is filled completely there is no way for the grease to escape except to be forced out through the seal around the shaft, and being completely filled, the balls or rolls in the bearing have to plow their ways through the grease continually. This produces friction and heat. This heat causes expansion of the close fitting parts causing wear and roughness, thus shortening the life of the bearing.

The ball bearing cartridge should not be filled originally more than ⅓ to ½ full of grease, using a non-hardening grease for ball and roller bearing lubrication. These bearings in normal service should not be greased but about every three months and then adding only a small amount of grease. This will vary on different applications and is given as a guide only.

Using the wrong type of motor on an application can mean only one thing, unsatisfactory operation.

Due to the shortage of new motors some service men bought up everything that looked like an electric motor. They had a number of units without motors, or wanted to use them as service motors while their customer's motor was being repaired. We have found applications where a split-phase motor which was originally used on a washing machine, attempting to run a refrigerator compressor. Light duty R.I. motors were also used in the same way. On large installations, three-phase squirrel-cage motors of normal torque attempting to do a job where the unit required a motor of high starting torque. You can readily see how important it is to have the correct motor for the application to insure trouble-free service.

Overload Protection

Another factor is of utmost importance, not only towards continued successful operation of electric motors, but also the protection of the appliance owner's property. This factor is proper overload protection.

Quite often you read in the paper where a fire was started by an overload circuit, or an electric motor catching on fire. This would not happen if there was proper overload protection in the circuit or motor.

While there are rigid regulations governing the loading and fusing of motors and light circuits, it is impossible for the city or state to police every home and business using electricity, to enforce these regulations, and this is where the refrigeration service man can render an invaluable service not only to his customers but to the community as well, provided he has taken the time to acquaint himself with the fundamentals of motor and circuit overload protection.

No doubt the following questions have arisen in your mind: What is the proper overload protectors or fuse to use on the different applications I encounter? How can I learn the fundamentals of circuit protection? Where can I secure this information? The answers to the first two questions can be solved by securing a copy of the National Electrical Code, which also answers the third question.

Two booklets I have found most instructive are the Protection Handbook and Fuseology. The former is based on the electrical code, the latter is a handbook on fuses and is one of the most instructive towards identifying the various causes of fuse failures and their correction. These two booklets are published by the Bussmann Manufacturing Company of St. Louis, Missouri, and are copyrighted. I do not know if these hand books are available to the general public, but if they are I would suggest you attemping to secure a copy of each.

In our repair division we use and recommend Buss Fustats and Fusetrons, because an ordinary fuse cannot protect a motor from burning up, it can only protect against a short circuit.

As an example, if an excess of current of only 25 per cent, say 5 ampers on a 4 ampere motor, is allowed to continue it will destroy the insulation, and sooner or later burn out the motor, but by using these Fustats or Fusetrons, such an excess of current opens the thermo-cutout in the Fustat or Fusetron before the motor can be damaged by this overloading condition. The Fustat or Fusetron will not open on the motor starting current which may in some cases be as high as 400 or 500 per cent of the nameplate current (on ordinary service). Even though the Fustats or Fusetrons used be of the same ampere rating as the motor, they have a long time lag to eliminate shutdowns resulting from high starting currents or harmless overloading.

The Man Who Repairs His Own

Now we come to the individual who insists on repairing his own motor, and I must include the refrigeration service man. This has caused the electric motor repair industry untold grief.

Prior to the war, good fractional horsepower motor repair men were at a premium. As the war continued these men were called to the service of their country which created one of the biggest problems facing the repair industry, for in the beginning of the war there were no provisions made by the Government for the deferment of these highly skilled men. Even today, more than two years after V-J Day, this shortage of skilled men still prevails, and it was this circumstance that caused the individual to attempt to repair his own motor, due to the long delivery dates caused by the lack of skilled help and scarcity of new motors.

How did the individual work this hardship on the repair shop! By his not knowing that the single-phase fractional horsepower motors are built with the precision of a good watch, and for their successful operation over a long period of time, they should and must be serviced by a repair shop which has the facilities and skill so necessary for this type of work.

An example of this precision, the repulsion-induction, condenser-start and split-phase motors have centrifugal mechanisms for short-circuiting the commutator on the repulsion induction motor, or disconnecting the condenser and starting winding in the condenser start motor and the starting winding in the split-phase motor. These centrifugal mechanisms have to operate at a predetermined speed which the motor manufacturer found to give the best performance on a specific motor. Generally these mechanisms short-circuit the commutator or disconnect the starting winding at about 1325 to 1375 RPM. These are approximate speeds and are used only as an example, because some makes of motors are more critical on which the governors operate as high as 1460 RPM.

Good Test Equipment Needed

To properly determine the throwout speed, a dynometer, or other testing equipment, must be used to control the load on the motor to be sure that the governor mechanism is operating at the correct speed for the motor being tested. This check assures satisfactory operation of the motor when installed on the application it is to drive only when all other conditions are sat, isfactory.

The dynometer is also used for checking locked-rotor torque, pull in and pull out torque wattage consumption, amperage, all of which will vary for different makes of motors even though they may be of the same horsepower rating.

Others factors which can cause failures within the motor itself are:

Worn governor assemblies and push rods.
Worn spring barrels and brush holders.
Improper adjustment or spacing of governor assemblies.
Improper spacing of contact points in stationary switches.
Misalignment of rotor in magnetic field, due to improper use of thrust washers.
Wrong grade of carbon brushes.
Condenser of wrong capacity.
Worn or loose bearings.
Short-circuit in armature winding or commutator.
Open circuit in armature or rotor.
Broken short-circuiting segment assembly.
Worn or pitted commutator.
Points of starting switch pitted or burnt.
Loose connection on terminal board.

The above conditions can only be corrected by your electric motor repair shop, which has all the necessary tools, jigs, testing equipment and skill to place the motor in first-class condition.

A Practical Comparison of "Freon 12" and "Freon 22"

By ED. ASPROTH*

REFRIGERANTS are used as a medium by which a refrigerating system can transfer heat from one source and dissipate it at another. Several substances can be used which are selected according to safety, ease of handling and practical engineering.

When a refrigerant has been selected, design engineers select materials, design valves, and build the condensing unit around the particular refrigerant.

These engineers are constantly testing and improving this equipment for various applications to give their product maximum efficiency. The refrigeration service engineer must prove to the customer that the design engineers and salesmen are right in whatever claims they have made, even though it necessitates sleepless nights, long hours, or taking the customer's wife out to lunch.

I shall attempt, in this short paper, to give a simple comparison of the characteristics of the two refrigerants, Freon 12 and Freon 22, in the way the refrigeration service engineer feels, hears, sees, and finds his answers to everyday service problems. As service engineers, we find our information through our organization and take the word from someone else well informed in his particular line or product. If we can assimilate these "know-hows" I'm sure that each one of us is better able to analyze and prove what may have been said about the refrigeration equipment. These characteristics should help us to better understand the servicing of equipment using Freon 12 or Freon 22, even though the data may be somewhat mathematically incorrect.

Freon 12 has become a very popular refrigerant. In fact many new refrigeration service engineers have not had experience in the "art and science" of handling any other type of refrigerant. Most refrigerants behave much the same in their reactions to pressure changes; therefore, a glance at a few of the characteristics of any refrigerant should show us how to efficiently handle and apply each one.

Freon 22 is just another refrigerant of the large Freon family. It has its place in industry and should be used for the purpose it was intended.

Like other Freons its popularity comes from its ease of handling—no pungent odor that can drive us from our work should a small leak develop. Institutional and public assembly occupancies demand it because of the panic hazard. Freon escaping in confined spaces has been known to put out fires due to its smothering effect; however, after Freon has come in contact with a flame or hot surface a very dangerous and toxic gas is produced, known as phosgene.

Both Freon 12 and Freon 22 are very stable refrigerants, and have low freezing points, — 252.4 F. and — 256 F., respectively. For most applications we need not consider these low desirable temperatures.

The data in Table 1 will aid us to better assimilate a picture in general from the comparative characteristics so that we may properly apply our "art and science" in rendering service.

The condensing pressure for Freon 22 rapidly increases as the saturation temperature increases; therefore, we must be able to control the condensing temperature. You know from past experience that water cooled equipment is essential for this, but you must be sure to consider the temperature and supply of this condensing medium. Drought, hot weather, and public demand dangerously reduce the water pressure.

Bearing loads increase with head pressure and special attention is emphasized by manufacturers when designing for Freon 22 equipment. The design working pressure for Freon 12 equipment in most cases can withstand the extra head pressure.

High pressure controls, safety valves, rupture members, water valves have to be

* Chief Instructor, Dunwoody Institute, Minneapolis, Minn. Talk delivered before 10th Annual Illinois Association RSES meeting.

Table 1 - Comparative Characteristics of F-12 and F-22

	F-12						F-22					
Head pressure 86° F Condensing temp.	93.2 PSIG.						169.1 PSIG.					
Head Pressure 110° F Condensing temp.	136.0 PSIG.						228.7 PSIG.					
Horsepower Requirements per ton at 5 F Evap. and 86 F Cond.	.997						.98					
	DEGREES F.											
	40	20	5	−20	−40	−60	40	20	5	−20	−40	−60
Back Pressure	36.98	21.05	11.81	.58	10.96"	19."	69.02	43.28	28.33	10.31	.61	11.89"
Compression Ratio at 86° Cond. Temp.	"	"	4.07	7.10	"	"	"	"	4.05	6.98	"	"
Approx. lbs. of 80° F. Refrigerant circulated / ton	3.54	3.69	3.81	4.03	4.24	4.46	2.68	2.74	2.81	2.91	3.01	3.12
Approx. cu. ft. of 80° Gas / ton / min.	2.80	4.14	5.66	9.97	16.6	29.1	1.75	2.57	3.54	5.38	9.88	17

changed or adjusted to fit the new refrigerant.

Leaks will also increase with additional pressure increasing maintenance and replacement of refrigerant.

The low side of a refrigerating system requires more "science" than "art." It is the greater source of problems. Our design engineers, I believe, will also agree that this side of the pasture is not the greenest when it comes to solving the headaches.

The condensing pressure remains in a relatively close margin of saturation temperature, but the low side saturation temperature depends chiefly on application and coil size. It is, therefore, the low side in particular that we use in choosing Freon 12 or Freon 22.

Inasmuch as larger compressors use packing glands and some have relatively large seal areas, it is important to select a refrigerant having an internal operating pressure with as little pressure differential as possible from atmospheric pressure. It would be preferable to have a slightly higher crankcase pressure, thus limiting the possibility of the intake of air and moisture at the weak part of condensing units which employ crankshaft seals.

From our comparative characteristics I would suggest Freon 12 down to minus 20 F. and Freon 22 from minus 20 to minus 40 F.

Another factor one should consider is compression ratio, which is equal to the absolute head pressure divided by the absolute back pressure. Thus at 5 F. saturation temperature and 86 F. condensing temperature, we have a compression ratio of approximately 4.07 for Freon 12 and 4.05 for Freon 22. As we lower the back pressure, the compression ratio increases. At minus 20 F. saturation temperature and 86 F. condensing temperature, we have a compression ratio of 7.10 with Freon 12 and 6.98 with Freon 22. When the compression ratio gets too great, the efficiency of the condensing unit decreases.

In addition, motor controls and temperature controls must be changed or adjusted to correspond to the new pressures.

Horsepower requirements remain quite even. As the back pressure decreases, the horsepower per ton increases. At standard

ton conditions 5 F. saturation temperature and 86 F. discharge temperature, the required horsepower is .997 for Freon 12 and .98 for Freon 22. Actual horsepower will be somewhat higher due to inefficiencies, friction, etc.

Better refrigerant control is possible in Freon 12 than Freon 22. The greater the flow of refrigerant necessary the more easily it can be controlled. Larger and more sturdy refrigerant controls can be used. This is one reason high latent heat content refrigerants are not usually applied to small systems.

Freon 12 requires larger liquid and suction lines. Eighty degree refrigerant entering the expansion valve requires 3.54 pounds of refrigerant per minute per ton at 40 F. saturation temperature, and 4.46 pounds of refrigerants per minute per ton at minus 60 F. with Freon 12. Freon 22 would require 2.68 pounds and 3.12 pounds of refrigerant per minute per ton operating at the same conditions.

Greater differences appear in the suction line sizing. The volume of vapor to be compressed per ton per minute under the same conditions as above would be 2.80 and 21.9 cubic feet using F-12 and only 1.75 and 17 cubic feet using F-22. This represents a lot of difference.

Vapor volume is also very important in compressor displacement; hence bulk and weight of condensing equipment.

Moisture Problem

Moisture has been a problem for any service man and perhaps will continue to be public enemy No. 1 in the refrigeration industry. Freons give warning with the presence of water in that they freeze at the refrigerant control. If a suitable drying agent is applied the moisture content can be reduced sufficiently to lessen moisture troubles.

Freon 22 is eight times more soluble in water than Freon 12. This allows more water to be present before freezing occurs. Relatively dry, Freon 22 as normally received in refrigerant cylinders, will not freeze out until a temperature of approximately minus 110 F. is encountered.

These two refrigerants are quick alike in oil miscibility on the high side and in the crankcase; however, oil separates from the refrigerant much in the way sulphur and oil behave in that oil floats to the top when using Freon 22, but when using Freon 12 it remains miscible. From our characteristics we find that a lesser gas volume is handled using F-22, and coils should have smaller clearances between the top of the evaporator and the liquid level to permit skimming of the oil from the coil, unless mechanical means of mixing are present, such as thermostatic expansion valve refrigerant control.

This lower refrigerant velocity in the suction line reduces the pressure drop that would normally be present in a Freon 12 system, thus preventing proper oil return.

Both Freon 12 and Freon 22 will cause foaming of the oil in the crankcase when the pressure is reduced too rapidly.

Wax separation in Freon 22 will occur at higher temperatures than with Freon 12. Good oil properly dewaxed and degummed will give satisfactory results.

Summary

In short, I have tried to point out various characteristics, which indicate that the two refrigerants require separate designing.

Select a refrigerant and let the design engineer build your condensing unit around it. Both are good refrigerants if used properly.

When we think of port openings, weight of valves, velocities, volumes, pressures, etc., each part in design varies with its intended application, and unless we follow recommended operating conditions our refrigerating equipment will not be efficient or practical.

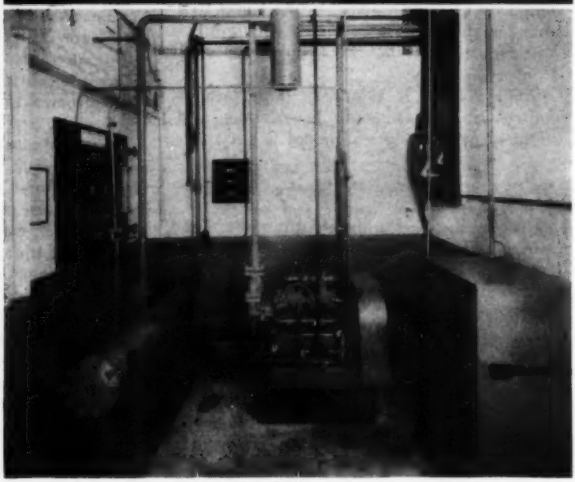
I know of some cases of change from Freon 12 to Freon 22. We can see from our characteristics that this change increases the capacity approximately 45% and a reduction in speed equal to this increase is necessary unless a larger prime mover is installed. This change-over and added capacity may do a temporary or particular job with reasonable results, but would not be operating efficiently. I don't recommend this change.

In all cases, manufacturers should be consulted before any change is attempted.

PROVEN BY TESTS

THE owner of a refrigeration service company in Portland, Oregon, showed that he respected the curiosity and skepticism of human nature. Namely, where fresh paint is concerned. After he had finished painting the exterior of his store, he hung up the "Fresh Paint" sign. Then he carried out an old unpainted barrel and gave it a coat of paint. He outfitted the barrel with the sign, "Test Here." The following day thirty fingermarks evidenced the fact that people are curious.

Freezing Apples for the Baker



IN THE installation pictured here, made by Refrigeration Sales Corp., Cleveland, Ohio, sliced apples in 30 lb. commercial cans are frozen at —20 F. for the bakery trade. Apples are precooled overnight, then placed in the freezer. The upper photo shows the Bush freezer unit with hot water defrost. The installation is capable of handling 12,000 lbs. of apples per 24 hours. Six inches of rock cork is used to insulate the room.

The condensing equipment includes a 25 hp. 8 cylinder, Freon-12 Schnacke compressor and a Schnacke shell and tube condenser. A 3 hp. compressor handles the high temperature cooler room. Shown near the ceiling in the lower photo is the Acme oil separator. A dual set of Ranco controls provides temperature change from high to low temperature setting by means of a two-way switch without changing control settings. Marsh gauges are used throughout.

Some of the installation features included in all equipment installed by Refrigeration Sales Corp. can be noted in the lower photo. For instance, operating instructions are hung on the wall for quick reference in case of emergency. Hand valve wheels are removed and hung on the panel board to avoid accidental shutting off of compressor discharge line, oil return line and others which would cause damage to the system. The dryer unit, mounted on the panel board, is equipped with a bypass and valves so it can be removed without shutting down the system. The oil return line is equipped with a strainer unit. Water to the compressor is controlled by a hand valve and a solenoid operated from the motor circuit. A strainer is used in the water line. Hand wheel valves are used in all gauge lines. A decalcomania on the panel board shows the installer's name. The concrete machine base is painted for added appearance and for ease in cleaning.

By DONALD F. DALY

WARRANTY SERVICE

TO GATHER the material for this subject I followed my usual custom of going directly to the men in the field and in the course of some thirty interviews with dealers and contractors I came up with the following cross section of opinion on warranty service. For reasons, which will soon be obvious, I was unable to dig up exact information on several phases of this important subject and have been forced to resort to generalities. However, I do believe that the opinions offered are comprehensive enough to enable the average contractor or dealer to get a fairly clear picture of the problems involved in warranty service.

There are several very good reasons why the situation in the warranty service field is obscure. The main reason is that dealers have not had this problem to deal with in the past few years and information based on recent experience is not available. Then too, a great number of the dealers and contractors have entered the refrigeration field since the war and they have never had any experience with warranty service at all.

The problems of warranty service have changed a great deal since it first came into being. In the old days when most of the household and small commercial refrigerators were of the open type belt driven variety, the warranty period was for one year and the manufacturer stood all, or nearly all, of the expense involved in such service. The manufacturer supplied all the replacement parts and the labor was paid on a flat rate basis for each operation performed. For instance. I recall that one major company made an allowance of $2.00 for changing a belt; $2.00 for putting on a new motor; $3.50 for exchanging an expansion valve, and so on.

With the advent of sealed units this system had to be modified somewhat since most operations involved exchanging the entire unit. As the number of sealed units increased the system was again modified until at the present time most warranty contracts are based on the following terms: There are two parts to the contract. The cabinet, hardware, electrical equipment, etc., are guaranteed for one year and the sealed in unit is guaranteed for five years. If any trouble develops on that portion of the equipment which is guaranteed for one year the dealer stands the cost of any labor required to make the repairs. The manufacturer supplies the replacement parts.

Concluding Article

Warranty service which should be charged to the sales department, has always been a thorn in the side of the service department because of a lack of accounting methods which would give the service department full credit for the time they spend on good-will calls. How one firm solved the problem is told among other things in this article.

After the one year warranty expires the manufacturer makes a flat rate allowance for labor involved in exchanging the sealed units. The amount of this labor allowance varies somewhat, but it seems to average about $7.50 per unit.

This method of reimbursing the dealer seems to work out pretty well as far as the exchange of units is concerned, but the flat rate schedules that were set up before the war (many of them are still in use) are away out of line. The cost of labor and material has gone up so much that it is impossible for a dealer to perform these operations at the prices contained in these old schedules.

It seems obvious that these schedules should be revised, but I could find no evidence that such revisions were being made. However, several dealers told me, off the record of course, that the manufacturers were no longer holding them to the flat rate schedules. The additional charge, to cover their increased cost, must be collected from the customer. Up to this time they have not had too much

trouble in getting the additional cost from the customer, but how long this happy state of affairs would last no one was prepared to state. Not too long I think. The customers are getting a little tired of being soaked for all the traffic will bear.

The problems involved in warranty service of household units represents only one small part of the entire picture, and as long as appliances are scarce it will probably be the least important. Some of the other phases of warranty service are more important for the immediate future and in an effort to find out how contractors are handling the warranty or free service situation on their commercial installations I made the rounds with a questionnaire. I tried to get answers to some of the questions that are being asked at this time.

The Questionnaire

QUESTION 1: Do you make a separate item of, and charge the customer for the cost of installation and free service?

ANSWER: No. We believe that the cost of installation and free service should be made a part of the selling price of the installation. However, we do consider this factor in making a bid and an allowance is made for free service when we submit a bid.

QUESTION 2: How do you arrive at the cost for free service for the first year's service on household refrigerators and home freezers?

ANSWER: On household refrigerators and home freezers we set aside a flat $5.00 per unit sold to take care of the first year's service. (After the first year the manufacturer stands the cost for labor involved in changing sealed units.) We find that about 80% of the service calls on new units will occur in the first two months after the sale, and more than half of these calls which occur in the first two months are to instruct the owner in the use of his new appliance, rather than to correct some mechanical defect. We average about two calls per unit during the first year.

QUESTION 3: How do you arrive at the cost for free service and installation on small commercial units and package units?

ANSWER: On package units having self-contained units, such as reach-in boxes, ice cream cabinets, beverage coolers, etc., we set aside from $10.00 to $25.00 per unit for free service. The amount depends on the selling price of the unit and the purpose for which it is to be used.

QUESTION 4: How do you arrive at the cost for free service and installation on small commercial installations having a remotely located unit?

ANSWER: The cost for installation and free service on this type of plant will vary with the installation. For instance, suppose that we were installing a condensing unit and coil in a reach in box, our charge for this factor would be based on a percentage of the cost of the material used in the installation, exclusive of the cost of the case. For example, our price for the one-half hp. air cooled unit would be about $165.00. The coil, expansion valve, dryer, tubing, refrigerant, etc., would come to another $150.00. For a total of $315.00. Now, if this were a simple job to install, with short runs of tubing, accessible location, etc., we would allow 10%, or $31.50 for installation and free service. If the condensing unit was water cooled we would probably allow 15%, or $47.25. But, if this same installation presented some unusual problems, such as inaccessible location, long runs of tubing, distant location of water supply, penetrations through concrete walls or floors, etc., we might allow as much as 25% of the cost of the materials, or $78.75.

QUESTION 5: How do you figure the factor for installation and free service on larger commercial installations?

ANSWER: On larger commercial installations we usually break the estimate down into its component parts and the amount for installation and free service would be figured separately. (The manner of figuring installation costs has already been covered in this series so we will concern ourselves with the matter of free service only.) We usually base the cost for free service on a percentage of the total cost of the installation. This percentage will vary with the installation and may run as low as 2% for a simple installation, and as high as 5% for more complicated installations.

For example, if we installed a 10 hp. unit on a large walk-in box having one or two coils at the same temperature, we would probably allow 2% to take care of the free service.

On the other hand, if this same 10 hp. unit were installed on a multiple job, with several coils and two or three different temperatures, we would probably allow as much as 5% for free service.

Conditions Are Variable

These questions cover the principal points involved in estimating free service. But, once again, it becomes obvious that it just isn't possible to give rules that will cover all of the problems of estimating any part of a refrigeration installation. Conditions vary from job to job, and from locality to locality and each contractor must work out his own method

of operation. To further clarify the problem involved in estimating for warranty and free service I had a number of interviews with service managers and appliance dealers. The problems uncovered in these interviews were as varied as the number of men interviewed, but they may tend to make clear some of the problems that will arise in conducting a service business which has to deal with free service.

I did discover one thing about warranty service and that is that a great many people do not have any very clear conception of its ramifications. Many dealers consider warranty service as a sort of burden which must be borne if he wishes to keep his franchise. Other dealers take warranty service for what it was intended to be—one of the most potent good will building factors available to appliance dealers.

The Warranty Contract

Since there seems to be so many men in the appliance field who do not understand the terms of their warranty contracts, it might be a good idea for everyone involved—from the owner of the business right on down to the newest apprentice—to take a copy of one of these contracts that are attached to almost every new piece of equipment and make himself acquainted with its provisions.

While phrasing of these contracts may vary from manufacturer to manufacturer they are, in the main, almost exact duplicates. The method of reimbursing the dealer for service work done under these contracts is pretty well standardized and is probably familiar to everyone who holds such contracts. The important thing seems to be, not so much the amount of money involved in such service work, but how this money is allocated. Some dealers consider this money as part of the gross selling price of the appliance and do not make any special provision for taking care of charges for service which results from these contracts.

Other dealers set this money aside in a special reserve fund and charge all such service against this fund. However, there are reasons, having to do with tax and bookkeeping problems, which make this method unsatisfactory. But one thing seems clear and that is, regardless of how this money is handled in the final accounting, it should always be shown on the books as a service fund so that the service department will have its own money and will not be placed in the position of having to operate on what appears to be handouts from the sales or advertising departments.

Most service managers are very bitter about having to operate their departments on this handout method. The principal beefs that grow out of this method are as follows. The service department does not get credit for all the work they do in building good will for the company. They are charged with work that should rightfully be charged to promotion and advertising. They are treated as stepchildren, and the owners do not recognize the important part they play in the business. I think I can best illustrate what I mean by telling the experiences of two service managers I interviewed. One of these men operated under the stepchild method, and the other operated under the allotment method. For obvious reasons these men must remain anonymous.

The Unhappy Service Manager

I dropped in at the service departments of one of the oldest and largest refrigeration and appliance dealers in this area. The parts man told me that the service manager was out, but he expected him back any minute. I decided to wait and after a few minutes a harried looking individual, with his hat jammed down over his eyes, and his lips moving in a manner that suggested all too plainly that his blood pressure was up to the boiling point, came striding into the shop. He brushed past me, slammed up the hinged door of the counter, stalked back to a desk at the rear of the shop, and threw himself down in a chair. He then reared back and planted his feet on the desk, pulled his hat down even lower over his eyes, and gave his undivided attention to that well known practice of cussing someone out in absentia. The parts man and I cautiously withdrew to the far corner of the shop.

After a few minutes the guy finally relaxed, pushed his hat to the back of his head, and heaved a sigh that blew papers all over the room. After observing him warily for a couple of minutes we edged up a little closer to his desk. He didn't appear to be violent so after a moment the parts man said, "Look, Joe. Here's a guy wants to talk to you about warranty service." For a minute I thought Joe was going to go off again. He gulped a couple of times, but got his feelings under control and asked me to come over and sit down. I introduced myself and after a few generalities we got down to cases on warranty, or as Joe called it, free service.

I very gently suggested that Joe start at the beginning and tell me his tale of woe. Believe me, brothers, Joe had a tale of woe, and I'll bet that dozens of service

managers all over the country have a similar story to tell.

"Now don't get me wrong," Joe began. "I've been service manager here for fourteen years. This is a fine company to work for and I have a free hand in most things. But I just can't make the directors understand that a man wants something out of his job besides wages. He wants to know that he is doing something constructive, and above all, he wants recognition for his ability and his good work, but the way I have to operate my department I never seem to get any of these things.

"You see," Joe continued. "This is an old company. We have had franchises with major companies almost from the beginning of the refrigeration and appliance industry. As is true with most of the older outfits who took on appliances as an addition to their regular business, the appliance business developed until it now represents the major portion of our total business. And, of course, the service department grew too, and we now have the largest service business in this area.

Could Not Change Policy

"When I took over here," Joe went on, "the policy for the service department had already taken root. I tried, from time to time, to get this policy changed, but was usually brushed off with the excuse that a change would involve too much bookkeeping. You see, the company has never made a practice of allocating the money made by the service department to the service department. All of the money money made by the service department goes into the general fund, and all of the money to pay the expenses of this department comes out of the general fund. My department is charged with every bit of work it does, but we never get any credit for free service or for service that should be charged to promotion and advertising. Consequently, we always show a loss at the end of the year. Every other department shows a profit, but I have to go on year after year trying to explain why we show a loss. It isn't fair.

"Here a few months ago," said Joe, "someone in the sales department got the bright idea that we should give a free checkup service to all of our customers who, due to the fact that we had no appliances to sell during the war, had not had an active account. This was a very fine good will building idea and we made several hundred calls in carrying it out. But my department didn't get credit on the books for a single one of these calls. No wonder I am always in the red. Then there is another problem that costs my department a lot of money, which should never be charged to us at all, and that is the practice of absorbing part of the cost of service to some of our older customers. I know that this is good business from the company's point of view, but the cost should go where it rightly belongs—to promotion and advertising.

"I don't suppose," Joe went on, "that it makes a particle of difference in the amount of profit shown by the company at the end of the year, but all of the other departments show a profit and I don't like to be an exception. I have a fine crew and I have spent a lot of time to train them. I am proud of my department and it gives me a lot of satisfaction to work with these boys. But damn it, I want more than that. I want my department to get its rightful share of credit for helping to build this business."

Well, there was a lot more of the same and I stayed with Joe until he got it all off his chest. A lot of people would recognize Joe if I gave his name and they would recognize his company, but I guess I hadn't better give out that piece of information just now. Anyway, I'll bet the same set of circumstances will fit other service managers.

I think I know why Joe's company continues to show a loss in the service department. It has always been considered good policy to show a loss in some departments for income tax purposes. The service department has always been handy for this purpose. But such practices do not tend to build good job records and it is hard to know just what it costs to do business if the proper allotments of money are not made. There is another side to this story and a much happier one, as you will see when you read the experiences of another service manager.

The Happy Service Manager

I almost passed up my interview with this guy because he had such a look of smug self-satisfaction that I didn't think I could stand him long enough to get his story. You know the type—one of those cocky guys that make you mad just on general principles. The sort that knows everything about everything and just about the time you think you have him out on a limb be comes up with the answer and makes you look foolish. However, this guy really had something on the ball and I am glad I waited to talk to him. If ever a service manager had something to be smug about, he did. And since it was all a result of his own doing you have to give him credit. (I wonder why it is that most old-timers in the serv-

ice business always resent these bright young fellows. I guess it must be because they seem to do easily what we had to struggle with and do the hard way. Of course they have more to go on these days. "Oh, yeah," says the bright young man.)

I'll just call this guy Bill. Partly because that is his name. "I know just what you mean," said Bill, when I told him about Joe's trouble. "Warranty, or so-called free service, has always been a headache in most shops. I was service manager for another outfit before I went in the Navy and we had the same situation to deal with. My department was always behind the eight-ball simply because we couldn't get credit for the work we were doing. When I got out of the Navy and took over this shop I made up my mind that things would be different.

No Free Service Here

"As far as this department is concerned," Bill went on, "there is no such thing as free service. I make a charge for every bit of work we do, regardless of its nature. If we deliver or pick up an appliance, I get paid. If we make calls to promote good will, I get paid. I don't know how they handle the bookkeeping in the front office, but so far as I am concerned, my department always shows a profit.

"I am very fortunate in this job," said Bill, "because of the fact that my boss started out as a serviceman. He knows the service business inside out and backwards. When I took over the department I told him that I wanted to get credit for everything we did. What I had in mind was for the company to set up a separate fund for service and let us operate out of this fund. Then, if I could show a profit on the business, I was to be given a bonus based on a percentage of the profits. I was willing to work for a small salary if I knew that my efforts would be appreciated. Of course I wanted to make money, but even more than money, I wanted to feel that the work I was doing to build the business was credited to the department. Then, too, a man who is operating a profitable department is in a very good position to get what he needs to carry out his work.

"The boss explained to me," Bill continued, "that it would not be possible to operate in this manner. I am not too clear on the reasons, but it seems that when a company carries money in a reserve fund, that money is subject to income taxes. Even though such money may be obligated to take care of future service work. Therefore, unless they wanted to operate the service department as a separate business, it would be better to continue the system they had used in the past. This would enable them to use the same accounting methods and would streamline the work of the bookkeeping department.

"The boss did, however," Bill went on, "agree that I could keep my own records in any way I saw fit, and as long as my records agreed with the records of the accounting department, we would be allotted the amount of money shown by my records. My records are very simple. I merely keep track of all the time that is charged on the time cards and this total, figuring the labor at list, is the amount of money due me for labor. Parts are figured the same way. We have what we call a rotating stock. That is all of the parts we buy are charged to my department. Then as we sell them out we credit our account with that amount. All parts which go to service equipment not on a guarantee are sold at list, so we have an additional margin from this source. As you know the manufacturer supplies the parts for work done on appliances that are still on the guarantee. I take care of all of the work of getting replacements on these parts. It sometimes takes several months to get these replacements, so for a while we were operating in the red as far as parts were concerned, but we have been operating this way long enough now so that our stock just about stays even. Of course we have to keep buying for outside service.

Service Gets Full Credit

"As I said before," Bill continued, "I don't know how they handle the bookkeeping in the front office, but every quarter the accounting department issues a report showing our financial standing. Everything that would be charged against us if we were operating a separate business is included in this report. Wages, rent, taxes, transportation, parts, etc. In the three years we have used this method the service department has never shown a loss. I have nine servicemen and we never have any labor trouble. We pay good wages and the boss has worked out a bonus plan which is shared in by every member of the service department. This bonus is paid quarterly. I guess I am pretty lucky to have this sort of set-up." (Yes, Bill, you sure are lucky. I think your boss is sort of lucky, too.)

Well, there you have two examples of how appliance dealers operate their service departments. In reality, these two examples represent the extremes. With Joe's case as the horrible example, and Bill's case as the ideal. Actually, the position of most service managers will fall somewhere in between these two ex-

tremes. However, one thing seems obvious, there is a Hell of a lot of room for improvement in the way most appliance dealers handle this situation. Most service managers resent having their department treated as a stepchild. Both Bill and Joe mentioned money, but neither of them stressed the fact that money was all important. It is all too true that "Man does not live by bread alone." Most men, especially mechanics, are much more interested in knowing that a job well done is appreciated.

Another man I talked to seemed to have the problem of giving a guarantee on new installations pretty well summed up when he said. "A guarantee is no better than the man who gives it. Guarantees have always been used, and abused, as a selling point. If a contractor is going to stay in business he has to stand behind his work. I never give a guarantee, as such, but I do insist, for my own protection, that I be allowed to stay with any new installation until it is operating to my satisfaction. Sometimes this can be accomplished in a couple of days and sometimes it may take two or three months. It frequently happens, especially on larger installations, that the plant is not put to work at its full capacity for some time. In such cases adjustments must be made and a contractor is very foolish if he fails to make these adjustments. And, what is more important, the contractor must be sure that the customer thoroughly understands how to operate his new equipment. I have never set up a service reserve or made a separate charge for service work on new installations. In my opinion this should be made a part of the selling price of the job and any expense that results from such service should be charged to the normal cost of doing business."

Concluding this series of articles.

BOOKLET ON WATER COOLING

"BETTER water for better living," is the theme of "The Water Cooler Story," a brief but complete booklet being issued widely in January by members of the Drinking Water Cooler Manufacturers Association, a division of the Refrigeration Equipment Manufacturers Association.

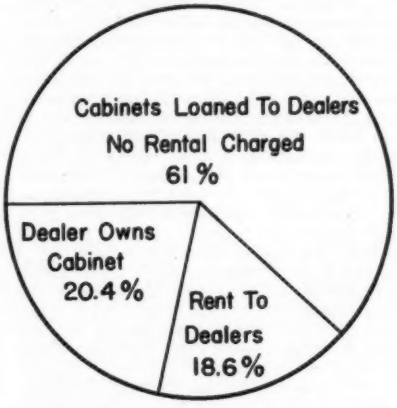
The first part of this attractive 28-page booklet is devoted to a thorough discussion of the importance of drinking water to health, efficiency and morale. Actual quotations of health, industrial, labor and merchandising leaders are used to prove that it is a fact that it pays to encourage the drinking of more water. The late Dr. John Harvey Kellogg is quoted as saying, "Anything you can do to increase the amount of water consumed by the American people will be a blessing to the country."

There are complete descriptions and illustrations of the general types of coolers on the market today and the booklet also offers factual advice on choosing the right type and number of water coolers to meet the requirements of various plants, offices and other business establishments. Suggestions are given on proper locations for installations, and floor plans are included of typical installations in large and small manufacturing plants, department stores, office buildings, filling stations, hospitals and small retail stores.

Copies of the booklet will be distributed nationally by members of the Water Cooler Association.

SURVEY SHOWS ICE CREAM CABINETS LOANED TO DEALERS

According to an analysis of delivery practices in the ice cream industry for the year 1945, made by the International Association of Ice Cream Manufacturers and published in special bulletin No. 72, 61% of ice cream cabinets reported in ice cream dealers' hands are furnished



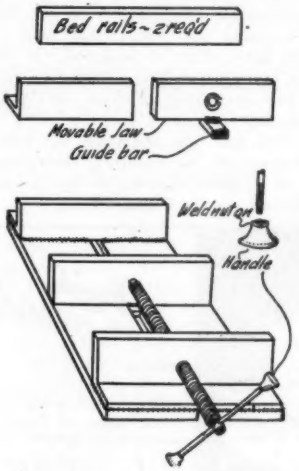
by the manufacturers of ice cream on a no rental charged basis. In the chart above, 100% equals the total number of cabinets reported in the survey. The chart shows, in addition to the 61% for which no rental is charged, that 20.4% of the cabinets are owned by dealers and that 18.6% are rented to dealers with a charge for rental being made.

SERVICE POINTERS

A department for the exchange of ideas on new devices and methods of improving service work. Five dollars is paid for each pointer published. Write up your idea today and mail it to the Service Pointer Editor.

DRILL VISE

HERE is a drill vise to hold objects so as to keep fingers or hands safe from injury when drill bit "takes" when a twist happens or when bit cuts through.



It can be made with 7 flat bars or 3 flat bars and 2 angles. Overall width can be 6". Length is determined by length of screw. It is fastened to table by a bolt welded in on bottom of vise between center and outer edge. Nut has handle to clear ribs on bottom of table.

The parts are assembled by welding.

—*From the Stabilizer.*

WARRANTY SERVICE ALLOWANCE

THREE general service plans recommended by one prominent manufacturer of refrigerators and home freezers to his distributors and dealers, are outlined in the following. Hermetic units are employed by this manufacturer, however the changing of a defective compressor is not included in the charges noted in the following:

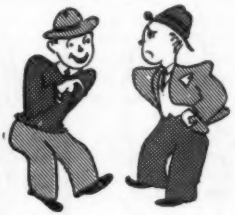
1—The distributor uses his own service organization for all service. He then charges the dealer $7.50 at the time the refrigerator is purchased. This includes cost of installation and one year free service to the customer. If the dealer makes the installation, the charge for the one year service labor will be $3.75. The charge the dealer would pay for installation and one year free service on a freezer would be $12.50 on a normal installation. If the dealer buys only the free service, he would pay the distributor $7.50.

2—The second method is similar to the above except the distributor contracts with an independent service organization.

3—The third method used is where the distributor has a service manager whose duties are to check franchised dealers and set up the dealer to handle his own service. The dealer is instructed to set aside a certain amount of money from each sale to handle service labor.

CROCHET HOOK USEFUL TOOL

IN MY service kit is a little "tool"—odd indeed for a refrigerator mechanic—a medium size steel crochet hook.



Yes, I carry a crochet hook. So what!

Nothing compares with it when it comes to removing and reinstalling extension springs in the complicated compact "innards" of cold controls and some starting

relay assemblies. Because of its small shaft size, a serviceman can better see what he is doing; the shaft is so manufactured that it will not turn around in your fingers; the shaft is just flexible enough to bend against the spring pull and prevent the spring loop from sliding away from the "hook" and down the shaft; the hook is small enough to get in between the spring loop and its anchor.

I use my crochet hook several times a week—especially on Westinghouse and Frigidaire cold control contact arm springs.—*Submitted by J. W. Gibb, Vancouver, B. C.*

SERVICE EXPERIENCES

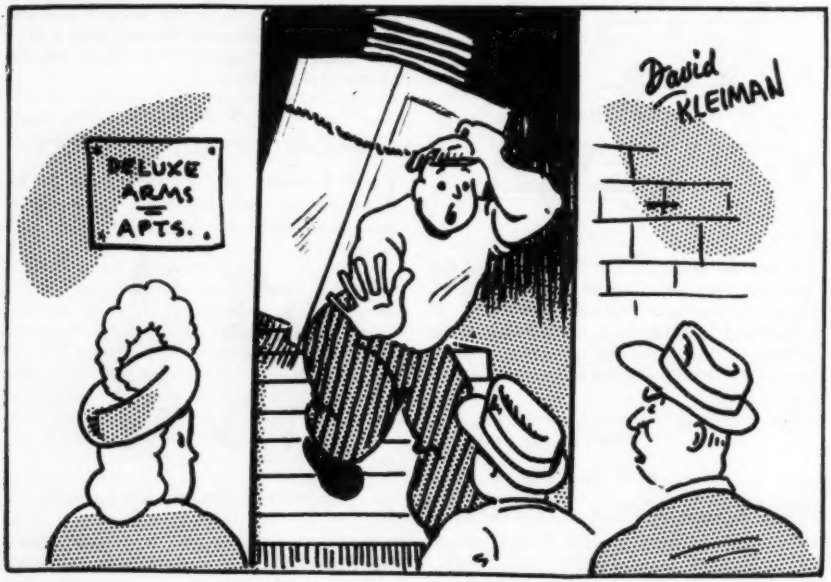
I WOULD like to hear more comments on flare fittings which are subjected to defrosting cycles. I find that about 25% of them give trouble and the time element varies from two months to two years. I have been under the impression that moisture gets between the shoulder of the flare and the flare nut and compresses the copper, thinning the flare, thus causing it to loosen. I have often wondered what effects it has on the threads and was therefore interested in the pointer "Doping Threads on Fittings" in the November issue.

I would like to submit the following experiences: I would say that 90% of the leaks are caused by frost boils, 10% seals and other causes. This does not take in leaks caused by vibration which are, as a rule, easy to find. I found this to be true in taking out old SO_2 equipment.

On several occasions I was about to put on a replacement compressor body because of knocks. The first time it happened I was removing the flywheel and in so doing found it loose. I put it back, making sure it was tight, and presto the knock was gone.

I had replaced a seal twice. This was the third time. A close examination with the body torn down revealed an oil return hole which drained all the oil from the seal. I plugged this hole and had no trouble after that. (Do not plug oil feed hole!)

I had added enough gas by weight and still the system appeared to be short of gas. I replaced the unit. Later on an examination revealed that the trouble was caused by the tube which is soldered into the receiver valve which had loosened permitting high pressure vapor to enter the liquid line. On another occasion I found a valve of this type with the tube too long. It rested on the bottom of the receiver, restricting the flow of liquid.—*Submitted by Harold L. Hendrickson, Crookston, Minn.*



"Now relax folks! A tenant is just sending his refrigerator to be repaired!"

QUESTIONS AND ANSWERS

Send Your Servicing and Installation Problems to the Question Box.

COMMENTS ON QUESTIONS

REFERENCE TO QUESTION 815: My calculations for 96 ft. of ¾" copper tubing are as follows: 96 ft. x ¾ x pi x 1/12 equals 18.85 sq. ft. 18.85 x 18 (K factor as stated) equals 337.9 Btu/hr./°F.

Charting this capacity against a 3 hp. unit at a 36 degree water temperature gives me approximately 35 degree temperature difference, placing the suction pressure at about 5 lb. gage if the unit uses F-12 and gives me a capacity of about 12,000 to 15,000 Btu. per hour. This is far too low. It would seem advisable to add more surface and some form of agitation if not already used.—*Leonard N. Fox, Chico, Calif.*

CAPILLARY TUBE NOISY

QUESTION 821: Recently we installed two 16" x 30" Dole freezer plates in a freezer box with inside dimensions of 24" x 33" x 19" with 2½" cork insulation. We put on a ⅓ hp. Frigidaire Freon unit, with a Wabash low temperature capillary tube. This box is thermostatic controlled and at zero temperature, 5 degree differential, 75 degree air, the running time is approximately 2 hours on and 4½ hours off.

Our customer is not entirely satisfied with the running cycle or the noise from the capillary tube. Would you please give us your opinion on same.

ANSWER: I have no fault to find with the installation or the operating time of the freezer.

The only criticism I might be inclined to offer is the thickness of the insulation. I think that 2½ inches of cork is not quite enough for the low temperatures required in a freezer. The operating time seems to me to be very good. You are getting less than one-third running time and that is about as much as can be expected of any refrigerating system.

If the noise from the capillary tube is a hissing noise at the end of the running cycle, then there is probably nothing you can do about it, but if this capillary tube is coiled inside the cabinet and the noise is a rattling noise, then I would suggest that you tape the coil tightly together to prevent any vibration in the tube while refrigerant or vapor is passing through it.

Very often the rush of vapor through the tube after the liquid seal is broken will cause a good deal of vibration in the coils of the tube. This vibration can be eliminated by taping as mentioned above.

MOTOR OVERLOAD CUTOUT

QUESTION 822: I have a problem which has been confronting me for the past year but has not given me sufficient cause to write you about until now.

It seems on most Wagner and G.E. motors there are internal thermal overloads which seem to pop out at the least provocation—sometimes when there is very little load on the entire system. I realize that the motor must have some protection and I am quite anxious to put lighter fusetats or fusetrons in if I can eliminate the overloads. My motor man says I cannot eliminate the overloads because they are built in.

There is one thing that is a complete disadvantage to any refrigeration system especially the ones down in southern Florida; this being that the humidity is always exceptionally high and the head pressures are extremely abnormal. The average Freon head pressures operate at 120 lbs.; Methyl Chloride at 150 lbs. and Sulphur Dioxide at well over 100 lbs. Naturally the motors are bound to pull a little harder and get a little hotter.

In each case I have always managed to get hold of an ammeter to check the amperage rating and do not find that it exceeds the amperage load on the name plate of the motor.

I would appreciate your advice as to how this can be overcome effectively.

ANSWER: The writer of this question has commented on the fact that a great many motors have inherent overheating protective devices which are built in the motors and according to his statement these devices operate and disconnect the motor from the line when there is no reason why they should do so. He states that it is his practice to measure the load on the motor with an am-

meter and in such cases he has found that the load is not greater than the full load current stamped on the motor.

Inherent overheating protective devices operate on a combination of motor current and air temperature. If the temperature of the air inside the cabinet is exceedingly high it may cause the inherent protective device to disconnect the motor from the line. If the current taken by the motor is abnormally high it also may cause the device to operate. If, however, one of these devices operate when the current in the motor is not greater than the nameplate stamping and when the temperature in the cabinet does not exceed 110 F, I would say that the inherent protective device is not operating properly and such a motor should be returned to the manufacturer for repairs. It can, of course, happen that an inherent protective device has been damaged or it may not have been correctly adjusted by the manufacturer of the device and in such cases the motor will not be allowed to carry its normal load. However, I believe that it would usually be found that the inherent protective device is doing its job well and that it is disconnecting the motor from the line because the temperature of the winding is reaching a dangerous figure due either to insufficient insulation in the cabinet or due to extremely heavy loads.

Summarizing our comments we would say that if an inherent protective device trips on a motor which is carrying only full load and an air temperature not exceeding 110 F, that the device is defective and the motor should be returned to the motor manufacturer. If, however, the current drawn by the motors exceeds 1.25 times the full load current stamped on the nameplate, or if the temperature in the cabinet exceeds 110 F, the inherent protective device is probably behaving just as it was supposed to do and the load on the refrigerating system should be reduced.

SHIPMENTS OF AIR CONDITIONING AND COMMERCIAL REFRIGERATION EQUIPMENT—THIRD QUARTER 1947

SHIPMENTS of complete air conditioning equipment and components and accessories for air conditioning and commercial refrigeration equipment were valued at $43.9 million during the third quarter of 1947, according to the Bureau of the Census, Department of Commerce. The third quarter 1947 shipments represent a decrease of 11 per cent from the postwar quarterly peak of $49.5 million shipped during the second quarter of this year.

Shipments of most major classes of components and accessories and complete air conditioning equipment decreased from the preceding quarter. The major decreases were as follows: heat exchanger equipment, 16 per cent, from $14.1 million in the second quarter to $11.9 million in the third quarter; self-contained air conditioning units, 14 per cent, from $10.6 million to $9.1 million; compressors and compressor units, 12 per cent, from $10.1 million to $8.9 million; and condensing units, 11 per cent, from $23.7 million to $21.0 million. Two major classes showed increases during this period: centrifugal refrigeration machines, 34 per cent, from $1.6 million to $2.1 million; and ice making machines, 21 per cent, from $0.5 million to $0.6 million.

This release is based on the activity of 71 manufacturers of components and accessories and complete air conditioning equipment. Estimates were made for a few companies, representing only a small portion of the total industry, that did not submit their reports in time to be tabulated. The data included in the release are believed to represent substantially all component manufacturers and air conditioning equipment producers.

The shipment statistics included in the report apply to equipment actually billed and shipped. These figures are equivalent to completed sales. Complete units delivered on consignment or shipped to a branch warehouse for stocks are not included until such time as they are actually sold. The dollar values shown are the manufacturers' net billing prices, f.o.b. factory. The data for some types of air conditioning and refrigeration equipment have been combined in the tables of this report in order to avoid disclosing the operations of individual companies.

Content of Report

Table 1 of this report presents summary data on domestic and export shipments for the second and third quarters of 1947. Section II of the table giving details on ice making machines and other units shows a continued increase in the value of ice making machines and other than room type coolers.

TABLE I.—AIR CONDITIONING EQUIPMENT AND COMPONENTS AND ACCESSORIES FOR AIR CONDITIONING AND COMMERCIAL REFRIGERATION EQUIPMENT: SUMMARY OF SHIPMENTS BY MAJOR CLASS OF PRODUCT, SECOND AND THIRD QUARTERS 1947

Product	Third Quarter 1947 Shipments of Complete Units						Second Quarter 1947* Shipments of Complete Units					
	Total		Domestic[1]		Export[2]		Total		Domestic[1]		Export[2]	
	Number	Value (dollars)	Number	Value (dollars)	Number	Value (dollars)	Number	Value (dollars)	Number	Value (dollars)	Number	Value (dollars)
SECTION I—COMPONENTS AND ACCESSORIES												
TOTAL	....	43,944,234	....	39,666,945	....	4,277,289	....	49,521,308	....	45,652,730	....	3 868,578
Condensing units	293,238	20,994,951	275,229	19,033,272	18,009	1,961,679	319,542	23,697,656	302,451	21,702,375	17,091	1,995,281
Ammonia refrigerants	419	560,316	370	510,477	49	49,839	438	533,470	395	488,132	43	45,338
Refrigerants except ammonia	292,819	20,434,635	274,859	18,522,795	17,960	1,911,840	319,104	23,164,186	302,056	21,214,243	17,048	1,949,943
Air cooled	283,972	16,808,899	266,572	15,210,838	17,400	1,598,061	308,017	18,897,124	292,060	17,362,437	15,957	1,534,687
Open type	117,940	10,456,526	102,391	8,944,141	15,549	1,512,385	140,534	12,257,495	126,585	10,867,251	13,949	1,390,244
Hermetic type	166,032	6,352,373	164,181	6,266,697	1,851	85,676	167,483	6,639,629	165,475	6,495,186	2,008	144,443
Water cooled	8,847	3,625,736	8,287	3,311,957	560	313,779	11,087	4,267,062	9,996	3,851,806	1,091	415,256
Compressors and compressor units	159,242	8,916,371	151,001	7,946,163	8,241	970,208	181,624	10,124,653	172,181	9,190,434	9,443	934,219
Ammonia refrigerants	970	2,260,309	762	1,803,208	208	457,101	1,118	2,152,382	935	1,670,631	183	481,751
Refrigerants except ammonia	158,272	6,656,062	150,239	6,142,955	8,033	513,107	180,506	7,972,271	171,246	7,519,803	9,260	452,468
Centrifugal refrigeration machines	84	2,086,789	63	1,631,291	21	455,498	71	11,558,179	58	1,378,533	13	179,646
Heat exchanger equipment		11,946,123	....	11,056,219	..	889,904	.	4,140,820	.....	13,381,388	....	759,432
Evaporative condensers	1,556	1,924,579	1,407	1,768,526	149	156,053	1,541	1,844,920	1,460	1,765,917	81	79,003
Unit coolers	33,227	4,797,278	29,864	4,356,959	3,363	440,319	40,570	5,498,214	37,431	5,136,933	3,139	361,281
Air conditioning	4,032	1,492,847	3,476	1,354,631	556	138,216	5,087	1,767,027	4,796	1,701,872	291	65,155
Refrigeration	29,195	3,304,431	26,388	3,002,328	2,807	302,103	35,483	3,731,187	32,635	3,435,061	2.948	296,126
Other heat exchanger equipment[3]		5,224,266	. .	4,930,734	....	293,532	....	6,797,686	....	6,478,538	....	319,148
SECTION II—SELF CONTAINED AIR CONDITIONING UNITS AND ICE MAKING MACHINES												
Self-contained air conditioning units	15,854	9,094,060	14,670	8,454.121	1,184	639,939	25,240	10,626,892	23,274	9,767,959	1,966	858,933
Room type	7,927	1,818,474	7,021	1,483,112	906	335,362	18,397	4,056,034	16,799	3,486,851	1,598	569,183
Other than room type	7,927	7,275.586	7,649	6,971,009	278	304,577	6,843	6.570,858	6,475	6,281,108	368	289,750
Ice making machines	1,866	627,761	1,722	489,899	144	137,862	973	517,099	897	489,861	76	27,238

* Revised.
[1] Continental United States.
[2] Includes Canada, Mexico, and United States territories.
[3] Includes condensers and liquid coolers, shell and tube and shell and coil types, as well as fin coils (heating and cooling) and plate type evaporators.

Compressor—Motor—Hermetic Rebuilders
Your Opportunity—Immediate Action Please!

Directory of Refrigeration Services *Invites Your Registration*

The deadline for listings, originally set for December 25, has been extended, by request, until March 15, to permit inclusion of additional listings.

AS A service to its readers THE REFRIGERATION SERVICE ENGINEER is going to publish a directory of refrigeration repair and exchange services in a forthcoming issue, and all companies offering repair or exchange services to service companies such as listed below, are invited to register for listing in the directory.

An Opportunity

Here is an opportunity to list, at no cost to you, those special repair services you are offering to service companies. This directory service, reaching all readers of this journal, will inform the serviceman just where he can send that hermetic unit, that compressor or motor to be repaired or exchanged. It will show him who specializes in the work he wants done and the address of the nearest such service.

Don't Delay—Register Now

If you have a repair or exchange service to offer the trade and would like to be listed in this directory, REGISTER NOW. Answer the questions in the following questionnaire and mail at once to—DIRECTORY OF SERVICES, REFRIGERATION SERVICE ENGINEER, 433 N. WALLER AVE., CHICAGO 44, ILL.

All listings in the directory must be in our hands not later than March 15th to be included, so don't delay—send yours in now. Tear out the following questionnaire and use it for your listing if you wish, or write a letter giving the following particulars.

Company Name .....
(Please print name clearly as it should appear in directory)

Street Address.....City and State.....

Your Name.....Position.....
(Owner, Manager, etc.)

Is repair or exchange service your principal source of business?.....

If not, what other refrigeration work are you engaged in?.....

.....

Do you have a catalog of services?..... Statement of policy and flat rate prices?..... If so, please attach for our files.

Place an (X) in the box in front of the services you offer.

- ☐ Hermetic Unit Rebuilding
  - ☐ All Makes
  - ☐ Specialize in (List Makes)

  ....

  ....

  ....
- ☐ Compressor Rebuilding
- ☐ Motor repair and Rewinding
- ☐ Cold controls and Thermostats
- ☐ Expansion Valves
- ☐ Water Valves
- ☐ Compressor Valve plates
- ☐ Crankshaft grinding, etc.

Others—Please list.

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CYLINDER SHORTAGE THREATENS PRODUCTION OF "FREON-12"

A SCARCITY of "Freon-12" fluorinated refrigerant is ahead unless users stop hoarding shipping cylinders or sending them out of the country, Kinetic Chemicals, Inc., warned recently.

The situation is critical for the vital deliveries that start in February and extend through the spring and summer. Return of empties has dropped so low in the last three months that, unless there is an immediate change, production of the refrigerant and its distribution in cylinders will have to be cut.

Kinetic officials say that for eight months they have been shipping loaded cylinders far in excess of the empty ones returned. They have placed large orders for new cylinders. Due to the steel shortage, however, delivery of these is too slow to solve the problem.

They stress that ICC Specification cylinders should be used for shipping only, and not for storage. In spite of this, they suspect, many loaded cylinders are being bought up and stored, while others are being shipped overseas through exporters, possibly never to be returned.

Raw materials for making "Freon-12" are short but not critically so. Present and new factory capacity appears to be adequate. Lack of cylinders is the only bad bottleneck.

S S S

LOS ANGELES ADOPTS NEW REFRIGERATION LICENSING AND SAFETY CODE

A NEW licensing and safety code for refrigeration contracting, sales, service and installation has been adopted by the City Council of Los Angeles and became effective on January 13, 1948, according to the Refrigeration Contractors Association of that city.

This code is the result of several years work on the part of committees representing all phases of the refrigeration industry in Los Angeles and was also approved by the Chamber of Commerce and other groups affected by it, and when finally presented to the City Council there was no opposition expressed by anyone to its adoption.

The licensing section of the new code provides for examination and licensing of contractors but does not call for either examination or licensing of mechanics or workmen. It is also of interest that it contains no requirement for a surety bond to be filed with the city to insure compliance. Los Angeles has had a surety bond requirement for many years and when it was found that no recoveries had ever been made under the bonds filed, it was decided to omit the requirement in the new code. Further, it is felt that the city has adequate authority to insure compliance with the code without the necessity of a surety bond.

The safety portion of the new code, while based in general on the A.S.R.E. 1939 code differs from it considerably. Among points of difference are the definitions of various types of occupancies which conform to the general building code and zoning laws of the City.

Also all reference to Group 3 refrigerants has been removed from the new code which provides that any refrigerant not listed may be used only on specific approval from the city authorities. This was done to reduce the possibility of any further explosions like the plating works and tanker disasters that cost many lives and resulted in tremendous property damage in Los Angeles in recent months.

S S S

STANDARDS COMMITTEE MEETS

THE first of a series of recommended standards for the commercial refrigeration industry—this one dealing with open-type condensing units—was brought near completion at a third industry-wide meeting held recently at the Neil House in Columbus, Ohio.

At the same session it was reported that "considerable progress was made toward the formation of a recommended industry standard for hermetic-type refrigeration condensing units."

Those attending the meeting were members of the Joint Engineering Committee of the Small Condensing Unit Industry, representing both ACRMA and REMA. Present were: A. B. Newton, Airtemp; A. D. Sullivan, Brunner Manufacturing Company; Lars Hanson and Mark E. Mooney, Acting Chairman, Carrier Corporation; J. L. Gibson and T. Benson, Frigidaire; C. H. Ehrenhardt, General Electric Company; George Davis, Lynch Manufacturing Company; George Kingston, Nash-Kelvinator; C. E. Ploeger, Servel; W. W. Higham, Universal; H. A. Brysselbout, York Corporation; and Leonard C. Bastian, Recording Secretary.

The proposed draft of the recommended industry standard on open-type condensing units was circulated prior to the Columbus meeting throughout both the refrigeration and electric motor industries. Considerable time was spent at the session in reviewing comments of the National Electrical Manufacturers Association, the American Institute of Electrical Engineers and the Motor Division of General Electric Company.

Another meeting of the Joint Engineering Committee has been called for March 22 and 23 at the Palmer House in Chicago to review a draft of the recommended industry standard for heremtic-type condensing units.

S S S

PROPOSED SIMPLIFIED PRACTICE FOR COPPER AND COPPER-ALLOY TUBE

A PROPOSED Simplified Practice Recommendation for Copper and Copper-Alloy Round Seamless Tube has been submitted to producers, distributors, and users for approval or comment, according to an announcement of the Commodity Standards Division of the National Bureau of Standards.

Proposed by the Copper and Brass Research Association, the recommendation lists preferred outside diameters and wall thicknesses for copper and copper-alloy round seamless tube.

In the opinion of the sponsors, general adoption of the recommendation should result in steadier production, and the repetition of orders for similar sizes should in due time permit the building of stocks, thus further regularizing production and facilitating distribution.

S S S

REVERSED CYCLE SYSTEM ADDED AS COURSE AT N.Y.U.

NEW YORK University's College of Engineering at University Heights will offer a course on the heat pump during the second term of the 1947-8 school year, according to an announcement made recently by Dean Thorndike Saville.

Recent developments in this field indicate that the heat pump may prove practical as a course of home and building heat. It is believed that New York University is the first engineering school in the metropolitan area to introduce a course on the heat pump.

The potential importance of this subject has been emphasized by increased interest of such groups as the American Society of Heating and Ventilating Engineers, the American Society of Refrigeration Engineers, the Edison Electric Institute, the Association Edison Illuminating Companies and others.

The new course will be given at the graduate level and will be under the direction of Professor E. N. Kemler, Research Professor of Mechanical Engineering and Assistant Director of Research of the College of Engineering. Studies will be concerned with heat pump design, application and theory. It will consider the system of reversed refrigeration as a source of heat for homes, commercial establishments and industrial processes.

Some time will be spent on a review of work which has been done and installations which have been made in the past. There will be a general analysis of thermodynamic processes involved in residential and industrial heat pump installations as well as studies on various heat pump cycles.

The design phase of the course will review the systems and problems involved in developing a practical device. Heat transfer principles, as applied to heat source and heat exchanger design, will be summarized. Data will be presented on the problem of adapting standard refrigeration elements to heat pump use.

Professor Kemler is well known in the heat pump field and he has presented many papers before technological groups dealing with his research on the subject.

Course will be given Mondays from 7:15 to 9:15 p.m. Additional information may be obtained from Henry J. Masson, Asst. Dean in charge of Graduate Division, New York University, College of Engineering, 181 Street & University Avenue, New York 53, New York.

S S S

ASRE PAMPHLET ON ICE CREAM

CURRENT refrigeration problems in connection with cooling ice cream mix during the manufacturing process and methods of freezing and hardening the finished ice cream are discussed in a seven-page pamphlet, written by Chester J. Bell, manager of the Portland, Oregon, branch of The Creamery Package Mfg. Company, and chairman of the ASRE Technical Committee on Dairies and Allied Industries. It is designated Application Data 41. Copies may be obtained from ASRE headquarters, 40 West 40th Street, New York 18, N. Y., for 35c each.

NEWS AND ACTIVITIES

AS WE GO TO PRESS WITH THIS ISSUE

The 10th Annual R.S.E.S. Convention is in progress in Cleveland, Ohio, as we go to press with this issue, therefore no report of the proceedings can be included. The March issue, however, will include a full account of all events together with a report of the all-industry Refrigeration and Air Conditioning exhibition.

COMING CONVENTIONS

Virginia State Charter Meeting
City: Richmond, Va.
Date: February 14, 1948
Chairman: B. A. Hauck, 3110 Kensington Ave., Apt. 9, Richmond, Va.

Iowa State Association
City: Waterloo, Iowa
Date: March 6 and 7
President: Ervin Meyer, 2960 Jefferson Ave., Davenport, Iowa

Wisconsin State Meeting
Place: Retlaw Hotel
City: Fond du Lac, Wis.
Date: March 20 and 21, 1948
President: Fred Hansen, 466 West Division St., Fond du Lac, Wis.

Interprovincial Association
Place: King Edward Hotel
City: Toronto, Ont.
Date: March 30, 31, 1948
Secretary: E. G. McCracken, 215 Laird Drive, Leaside, Ontario

Buckeye State Meeting
City: Canton, Ohio
Date: April 3 and 4, 1948
General Convention Chairman: Carl Howenstein, 1221 3rd St., N.E., Canton, Ohio

California State Association
Place: Palace Hotel
City: San Francisco, Calif.
Date: April 30, May 1 and 2
Chairman: David Fagg, 1951 E. 14th St., Oakland, California

Illinois State Assn. Meeting
City: Springfield, Illinois
Date: September
Secretary: B. V. Clark, 612 N. May Street, Aurora, Illinois

BURLINGTON, IOWA, GROUP FORM CHARTER

ON DECEMBER 2nd a group of refrigeration servicemen met at the Oetken Refrigeration Company to consider forming a chapter of the Refrigeration Service Engineers Society. Ervin Meyer of Davenport, Iowa, president of the Iowa State Association, called the meeting to order and explained the purpose, benefits and aims of the Society. Albert Johnson made a motion that the group petition the International Society for a local charter and the motion was seconded and carried. Temporary officers were then elected with Mr. Hogan being named temporary president; and Lawrence Oetken being named temporary secretary-treasurer.

In considering a name for the chapter, Eugene Anderson suggested Blackhawk Chapter and this name was finally adopted by the group. Dues are set at $12.00 per year with no initiation fee being charged charter members. Regular meetings will be held on the first Monday of each month. No constitution or by-laws have been discussed up to this time, nor has jurisdiction of the chapter been indicated. These matters will be taken up at forthcoming meetings.

* * *

PARDON OUR ERROR

AT THE bottom of page 76 in the article entitled "An Excursion Into the Desert of Events," appearing in the January issue, the statement was made "The forces of nature, of course, soon catch up with this phenomenon and the temperature of the water *lowers* to its freezing point and then the water becomes a solid." This should have been *raises* to its freezing point.

DISTRICT OF COLUMBIA CHAPTER RECEIVES CHARTER

A VERY interesting meeting of the District of Columbia Chapter was held at the Burlington Hotel, Washington, D. C., December 12.

The meeting was called to order by the president, Reese W. Davies. After a short business session, Mr. Davies introduced W. Booth, International Director and President of the Virginia State Association, and asked him to preside as chairman of the meeting. Mr. Booth introduced C. C. E. Harris of Cambridge, Mass., International 2nd Vice-President, who presented the charter to the chapter, which was accepted by President Davies. After presenting the charter, Mr. Harris gave a talk on the history of the organization and urged all members to live up to the obligations of the order. Mr. Booth next introduced Paul B. Reed, Chairman of the International Educational and Examining Board, who gave an outline of the proposed educational program for the coming year. Another visitor of the evening was A. Hauck, Vice-President, Virginia State Association.

The District Chapter was formed by twenty-seven charter members, all employees of the Naval Research Laboratory, Washington, D. C., but the chapter takes in the Metropolitan area of Washington, D. C., and by February the membership should be well over the hundred mark. The Refrigeration Supply and Nash Kelvinator Corporation of Washington, has been giving the organization their whole-hearted cooperation and the employees of both firms have joined the local chapter.

President Reese W. Davies of the new District of Columbia Chapter receives charter from Chas. C. E. Harris, International 2nd Vice-President, in a colorful meeting held at the Burlington Hotel, Washington, D. C., December 12.

The new chapter extends greetings to all the other chapters of the Society and wishes to thank the officers of these chapters for the Christmas cards received by Raymond E. Sibley, Secretary of the District of Columbia Chapter.

Officers, members and guests in attendance at the charter presentation meeting of the new District of Columbia Chapter. The group picture shows in the front row, left to right, second from left, R. E. Sibley, Secretary, District of Columbia Chapter; H. F. Helms, Vice-President, District of Columbia Chapter; R. W. Davies, President. District of Columbia Chapter; Walter E. Booth. International Director, President of Virginia State Association; Chas. C. E. Harris, International 2nd Vice-President; Paul B. Reed, International Chairman Educational and Examining Board; A. Hauck, Vice-President and Chairman, Codes and Ethics, Virginia State Association, President Richmond Chapter; J. B. Mills, 2nd Vice-President and Chairman Educational Committee, District of Columbia Chapter.

Rema to Hold Educational Exhibits with 2nd Annual Western Conference

Palace Hotel, San Francisco, California
April 30, May 1 and 2

ONE of the most important recent announcements made by the Refrigeration Service Engineers Society is the completion of arrangements whereby the Refrigeration Equipment Manufacturers Association will conduct an educational exhibit in conjunction with the 2nd Annual Convention of the California Association of the R.S.E.S. This show will comprise between 75 and 100 individual manufacturers educational exhibits. The convention and exhibit will be held in the well known Palace Hotel, April 30, and May 1st and 2nd.

This educational display will inaugurate the first of four such regional educational conferences. Present plans call for similar educational exhibits and conferences in conjunction with the New England States annual meeting in Boston in October, and with the 12th annual convention of the International Refrigeration Service Engineers Society in Chicago in November, 1948. One other conference will be held in the south, the locality to be selected at a later date, probably in February 1949.

After several months of active work on the part of joint RSES-REMA committees, definite arangements have been concluded whereby service engineers, contractors, and dealers will have an unexcelled opportunity of attending educational exhibits staffed by engineers and service personnel of the principal equipment manufacturers in their own communities.

This progressive move will be the answer to providing educational exhibits in convenient locations for the service industry throughout the country. Regional conferences will be held on the off years of the All Industry Refrigeration & Air Conditioning exhibition.

Exhibition space in regional exhibits will be offered without charge to exhibitors who participated in the All Industry show at Cleveland with the express provision that such exhibits must be strictly educational displays, either working or cutaway model engineering and application data. This policy will be strictly adhered to and the refrigeration manufacturers will have supervision to see that the plan is carried out.

Attendance in the exhibition will be limited to engineering and service personnel. The educational part of the conference will be under the supervision of the RSES as well as entertainment features and other activities outside of the exhibition.

Committee Chairmen of the 2nd Annual Western Refrigeration Educational Exhibit and Conference. Front row, left to right: David Fagg, Oakland, General Chairman; M. B. Willis, San Francisco, Contracts. Rear row, left to right: C. L. Rusten, San Francisco, Publicity; R. F. Cooke, San Francisco, General Arrangements; W. E. Wharton, Oakland, Coordinating Chairman.

You Have a Date in 1948 in the City of the Golden Gate

With the above slogan and spurred on by the prospects of the most important refrigeration educational conference and exhibition to be held on the coast, the California Association of the Refrigeration Service Engineers Society is completing plans for its second annual convention. Work on the convention has been progressing for months, and the recent decision of the Refrigeration Equipment Manufacturers Association to start the regional educational conference in conjunction with this meeting assures an

(Continued on page 60)

Simplify Your Service....

Improve System Efficiency

WITH

DEPENDABLE
Refrigeration Valves

Check The Advantages of This *New* *One-Ton* A-P Model 304 AUTOMATIC EXPANSION VALVE

Now your larger refrigeration units may have the benefits of popular A-P Automatic Expansion Valve efficiency! The new A-P Model 304 offers accurate refrigerant control and maintains constant evaporator

New A-P Model 304

Automatic Expansion Valve with Metal Cap and [illegible] Type Needle. [illegible] units of 1/3 [illegible] or less, use A-P Model 204.

Now your larger refrigeration units may have the benefits of popular A-P Automatic Expansion Valve efficiency! The new A-P Model 304 offers accurate refrigerant control and maintains constant evaporator pressure on systems up to 1-ton Freon, or 1½-tons Methyl or Sulphur capacity.

The new A-P Model 304 is similar to the famous ⅓-ton Model 204 in many important features. Its *Metal Cap*, rubber-gasket sealed to prevent moisture freeze-ups, is easily removed for quick and easy adjustment by means of the fine-threaded adjusting knob. No tools are required. A unique new needle, precision-finished to mirror smoothness, is self-adjusting, avoids sliding friction, and assures smoother, faster closing because of its floating construction. Has full range of adjustment from 15" vacuum to 35 lbs. pressure. Many other advantages recommend the new 304 for installation on all those systems requiring an automatic valve. See it at your wholesaler or write for bulletin No. E200.

New A-P Model 304

Automatic Expansion Valve with Metal Cap and [illegible] Type Needle. [illegible] units of 1/3 [illegible] or less, use A-P Model 204.

Metal Cap sealed against moisture. Easily removed for adjustment without tools.

AUTOMATIC PRODUCTS COMPANY

Export Department, 13 East 40th Street, New York 16, N. Y.

DEPENDABLE REFRIGERANT VALVES

E200A

STOCKED AND SOLD BY GOOD REFRIGERATION WHOLESALERS EVERYWHERE . . .
RECOMMENDED AND INSTALLED BY LEADING REFRIGERATION SERVICE ENGINEERS

One of San Francisco's famed cable cars goes up California Street in the Chinatown Section.

The San Francisco-Oakland Bay Bridge with the city in the background.

The Golden Gate Bridge spans the entrance to the Bay with the city and the other famous bridge in the background.

outstanding event. The region served by the Western Conference includes the eleven western states of California, Oregon, Washington, Idaho, Montana, Nevada, Utah, Arizona, Wyoming, Colorado, and New Mexico. All interested in the refrigeration business from these states are urged particularly to take advantage of attending this conference and learning from actual working displays the information so essentially needed in their business today.

Make Hotel Reservations Without Delay

Hotel space should be reserved early. A housing bureau has been organized for the 2nd Annual Refrigeration Educational Exhibit under Frank Dwyer, Chairman Housing Committee, Palace Hotel, San Francisco 19, California. All reservations should be mailed to the chairman. Because of the limited number of single rooms available, it is advisable for those attending the convention to share rooms whenever possible. All requests must be accompanied by a deposit of $5.00 per person or $10.00 per room, made out to the RSES Housing Bureau. Due to the existing crowded conditions, hotels cancel unclaimed reservations by 6:00 P.M. Therefore, to avoid any possible misunderstanding, the deposit holds the room on your arrival day whatever the hour. Bring cancelled check or hotel confirmation, as proof of reservation. All reservations must be cleared through the Housing Bureau. All requests must give definite date and approximate hour of arrival as well as departure, also names and addresses of all persons who will occupy rooms requested. All reservations will be confirmed if request is received not later than April 20, 1948. When reservations for rooms are made, indicate approximate rate you desire.

Officers of the California State Association are: J. Pat Riley, Long Beach, *President;* Rowland F. Cooke, San Francisco, *1st Vice-President;* A. H. Brundage, Fresno, *2nd Vice-President;* Gerald S. Kennedy, Sacramento, *Secretary;* Vernon Denny, Pasadena, *Asst. Secretary;* M. R. Hanks, San Diego, *Treasurer;* Everett F. Brown, Compton, *Sergeant-at-Arms;* and Merle A. Soden, Anaheim, *Educational Director.* Board of Directors—Frank A. Frazier, San Bernardino; L. L. Kannon, Bakersfield; Norman Overweser, Salinas; Stillman H. Peck, Pomona; James C. Rodgers, Los Angeles; Allyn W. Schoen, Sacramento; and William E. Wharton, Oakland.

STANDARD EVAPORATORS

MODEL No.	JS-25	JS-422	JS-35	JS-633	JS-45
Trays	1 Single 1 Double	2 Single 2 Double	1 Double 2 Single	4 Single 2 Double	3 Single 1 Double
Cubic Ft. Capacity	4 to 6	8 to 10	5 to 8	10 to 12	9 to 12

SOLD THROUGH LEADING REFRIGERATION WHOLESALERS

Standard Refrigeration Company

20 NORTH WACKER DRIVE *CHICAGO 6, ILLINOIS*

A Christmas Story for the Entire Year

By J. PAT RILEY
President, California Assn., RSES

THROUGH a chain of events, it was proven in Long Beach, California, that refrigeration engineers have big hearts and therein lies our story.

By chance, a member of Long Beach Chapter learned of a blind widowed mother in a nearby town. Now this mother's only support is provided by her fourteen-year-old son, who carries two paper routes besides going to school. The case was brought before the Chapter and it was the unanimous opinion that we should help this family. It was decided that we would give the boy a bicycle, so Fred "Pop" Riley, who heard of the case and brought it before the group, was appointed Chairman of the newly formed Welfare Committee along with Treasurer Stewart Bell and Secretary Robert Schooler.

The three men called upon this mother and were informed that the boy had just won a bicycle by selling subscriptions for a paper. In the ensuing conversation, they learned that this lady's fondest desire was to own a seeing eye dog so that she could go out and help her son earn the living for the family.

Upon seeing the home of this unfortunate mother, the committee began to think of securing the dog. "How much do you suppose one would cost?" asked "Pop" Riley.

"About a thousand dollars, I would guess," volunteered Stu Bell.

"Heck, we can raise that much," from Bob Schooler; "That is only a thousand grease monkeys with a dollar each."

After some inquiries, the three samaritans heard of the California Guide Dog School, which is in Long Beach, and lost little time in reaching the place. Upon entering, they were greeted by a cheerful little old man who introduced himself as Albert Schuepbach, Instructor of the School. "Pop" very eagerly said, "We want to buy a dog!"

"Gentlemen, you couldn't buy a seeing eye dog here if you laid a million dollars on that desk." Then before the look of dejection had settled too deeply on the faces of the visitors, Mr. Schuepbach continued. "We give our dogs to the blind because we are a non-profit organization and are supported by donations."

The above pictures are of Mr. Schuepbach and one of his dogs. They were taken at the Christmas Dinner-Dance held by the Long Beach chapter.

The story of the unfortunate mother was related and the kindly Mr. Schuepbach promised to look into the case.

The next day, the committee was informed that another organization was also seeking to provide this lady with a dog and they were assured that their efforts were not in vain.

Because of the committee's interest and investigation, a desire to help the school was instilled in their hearts and Mr. Schuepbach was invited to attend the Chapter's Annual Christmas Dinner-Dance, along with the President of the School, Mrs. Hoyt Nelson. At the gala affair, Chairman Riley told the story and Mr. Schuepbach gave a very interesting report of the school's work and then put one of his beautiful German Shepherd "pupils" through a demonstration of leading the blind. A donation was taken for

the school and a very gratifying amount was turned over to Mrs. Nelson.

That would normally be the end of the story, but not with big hearted refrigeration men present. Harold McQuay, President of the Los Angeles Chapter, was so enthused with the talk and demonstration that he invited Chairman Riley and Mr. Schuepbach to attend the Los Angeles Christmas Party a week later.

A similar demonstration was put on and another large sum was donated to the school. No, that is not all. President McQuay, in his thanks for the demonstration and talk, brought up the fact that many men in our own industry have been blinded in our work. That's it! An insurance, that we, through our help of the school, can provide for any of our own fellow tradesmen that might lose their sight.

What now on our campaign? Ed Warner, First Vice-President of the Arrowhead Chapter, was also impressed. So now Mr. Schuepbach and his fine dogs are invited to visit that Chapter's party on January 17th, in San Bernardino. And likewise, President Clarence Stumph of the San Gabriel Valley Chapter extended the invitation for the demonstration at his Chapter's party on February 5th, in Pasadena. So the oak tree grows!

Have we lost sight of the blind mother? Oh, no! A new radio has been placed under her Christmas tree by the committee and she is to have a fine, big turkey for dinner on that happy day.

Editor's note: The California Guide Dog School has been investigated and found to be truly a wonderful organization. Chief of Police Slaight of Long Beach is Chairman of the Board of Directors. All workers and officers are volunteers, except Instructor Schuepbach and his wages wouldn't suit the newest apprentice in our business. If you find it in your hearts to add to this "insurance" and to help out a worthy cause, your donations may be sent to Treasurer Stewart Bell of the Long Beach Chapter. His address is 1119 St. Louis Ave., Long Beach 4, Calif.

FIRST OF A SERIES OF EDUCATIONAL PROGRAMS PRESENTED BY UCD

THE Universal Cooler Division of International Detrola Corporation of Marion, Ohio inaugurated a new Education Program for the various customers, parts jobbers and refrigeration groups on December 2nd, when the program was presented before approximately 75 members of the Akron Chapter of Refrigeration Service Engineers Society. The program was presented at the regular meeting of this society in Akron.

This program was prepared through the cooperation of the Sales, Service and Advertising and Sales Promotion Departments to fill a definite need—that of better acquainting the entire refrigeration service industry with Universal Cooler Division's products, sales and service policies. C. M. Hatcher, Advertising and Sales Promotion Manager, states, "Over three months have been spent in research and preparation of

Here is a part of the group of 75 Akron Chapter members who attended the U.C.D. meeting.

NEW!

SOUTH BEND 14" Drill Press

South Bend presents this new 14" Drill Press as a companion to the South Bend Precision Lathe. It is built with the same high standards of accuracy and skilled workmanship. Years of painstaking research and experimentation have gone into its designing. This has resulted in a superior tool that is unsurpassed for accuracy, ease of operation, versatility and dependable performance.

$98.00 f. o. b. factory, bench model with chuck, extension cord and switch; less motor.

FEATURES and SPECIFICATIONS

BELT TENSION RELEASE. Quick-acting belt tension release lever simplifies speed changes. Keeps tension correct.

BUILT-IN LIGHT. Provides shielded illumination for work area. Separate on-off switch.

SPINDLE. Free-floating design prevents misalignment, side thrust and whip. Travel of spindle . . . . . 4"

BALL BEARINGS. Sealed type. No oiling. 2 on spindle drive unit, 2 on spindle.

QUILL BEARING ADJUSTMENT. Compensates for wear.

DEPTH GAUGE. Graduated in inches. Adjustable collars control feed and return.

RUGGEDLY CONSTRUCTED. Precision-built for industrial and all other types of shops.

TWO MODELS. Bench or floor type.

CAPACITY. Maximum drill size in iron or steel, ½". Drills to center of 14" circle.

CHUCK. Capacity . . . . . 0 to ½"

SPEEDS. Four . . . . . 707, 1305, 2345, 4322 r.p.m.

CHUCK TO BASE DISTANCE. Bench Model . 17" Floor Model . . . . . 46½"

TABLE SIZE. Tilt Type . . . . . 10" x 10"

COLUMN. 2¾" diameter. Accurately ground.

HEIGHT. Bench Model, 35½" . . . Floor Model, 65½"

SHIPPING WEIGHT. Bench Model . . . . 195 lbs. Floor Model . . . . . 235 lbs.

MOTOR REQUIRED. ½ h.p., 1725 r.p.m. Vertical mounting. On-off switch provided.

SOUTH BEND LATHE WORKS

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this program and already, we have numerous inquiries and requests to visit other meetings and present this program."

A large easel has been prepared and is used in the presentation of this combination sales and service program. The easel pages are devoted to following UCD programs during its part of 25 years in the refrigeration industry. Pictures of the first refrigeration condensing units have been photographed and a comparison of photos of latest models in the open type self-contained, open type remote and hermetic condensing unit models is very interesting.

The service department is utilizing this combination program to better acquaint the service men and parts jobbers with the identity of various types and styles of Universal Cooler compressors to be found in the field. Details are also given as to the proper procedure in returning compressors and other parts to the service department for repair.

In preparing this program, it is designed to enable anyone of UCD field service engineers to present the program in any locality with the aid of a service department representative. At the recent Akron meeting, Ed Halsey of the UCD Sales Department spoke during the sales department's portion of the program and A. E. Weber and J. J. Croushore of the UCD service department handled the service department's portion. Literature on UCD products and service was distributed at the Akron meeting and each attendant was given the UCD six inch pressure temperature chart rule.

IOWA STATE TO MEET MARCH 6

THE second annual convention of the Iowa State Association is scheduled to be held at the President Hotel in Waterloo, Iowa on March 6, and 7th 1948. Registration will begin on the evening of March 5th.

An excellent educational program has been arranged as well as plenty of entertainment. The program will include talks by Frank Carter, Detroit Lubricator Company on valve design and application and Paul Reed, Perfex Corporation on Reverse cycle refrigeration. Other interesting features are also scheduled.

A men's luncheon and ladies bridge luncheon are scheduled for Saturday noon and a joint banquet and dance has been arranged for Saturday evening.

In order to enable the servicemen and contractors to discuss their problems directly with the equipment manufacturers, table space will be provided for any manufacturers or wholesalers who wish to attend.

Anyone wishing to attend this meeting should contact Richard M. Herbert, Committee Chairman, 2033 Grand Blvd., Cedar Falls, Iowa for reservations.

LONG BEACH LADIES ORGANIZE

THE Ladies' Auxiliary of Long Beach, Calif., was inaugurated November 12 and they have the distinction of being the first Auxiliary to be formed in the State of California. Ten wives of members of the Long Beach Chapter were present at the inauguration meeting and from this group

The Birmingham Chapter held their annual Christmas party on December 17th, 1947, at the Plantation Club, a popular night spot just out of Birmingham, on the Atlanta Highway. The party got under way with a cocktail hour and was followed with a delicious steak dinner with all the trimmings. Door prizes were given and a Christmas tree loaded with presents for everyone. The above picture was taken and a wonderful time was had by all.

the first officers were elected. Mrs. Edward Murphy is the first President of the Auxiliary; Mrs. Pat Riley, Vice-President; Mrs. Stuart Bell, Treasurer; Mrs. Joseph Mura, Secretary; and Mrs. Thomas Ringrose, Sergeant-at-Arms.

The first big regular meeting was held December 10 and when all applications for membership were counted it was found that the membership had been more than doubled since the original meeting. All committees have been appointed by the group and with the cooperation being offered by everyone, it is felt that the Auxiliary will be the best in the State of California.

S S S

Chapter Notes

• ARROWHEAD CHAPTER, *Riverside, Calif., Dec. 8*—Pres. Herb Kaeding called the meeting to order and after a brief business session, Educational Director Carlton Ricker introduced the speaker of the evening who was Harold Halls from Los Angeles. Mr. Halls discussed the educational side of refrigeration service and engineering, after which he passed the certificate awards out to those who qualified. Mr. Kerr then took over the question and answer period. The questions discussed were those asked in the certificate examination. The drawing for the evening was a $2.00 merchandise order from Van's Supply, Long Beach, and a flare nut wrench donated by Charles Olbright.

• ATLANTA CHAPTER, *Atlanta, Ga., Dec. 15*—Although this was the first meeting held which was not preceded by a dinner, an excellent crowd was in attendance. An outstanding educational program was provided by Jud Bowen, engineer of the Penn Switch Company, who not only showed diagrams and slides of their various switches but described the installation and setting in detail. During the business meeting, a code committee was appointed to start work on a local refrigeration code. Application for membership of James R. Cook was voted and accepted.

• BERKSHIRE COUNTY CHAPTER, *Pittsfield, Mass., Dec. 11*—The election of officers was held with the following results: Albert Garnish, *President;* Robert Smith, *1st Vice-President;* Elmer Baldwin, *2nd Vice-President;* Leonard Whitney, *Secretary;* Ray Allen, *Treasurer;* and Arnold Brault, *Sergeant-at-Arms.* Chairman of the Educational Committee—Lawrence Seasons. Edward Whitack was named chairman of the membership committee, to be assisted by Messrs. Baldwin, Seasons and Whitney. Meetings are to be held the second and fourth Wednesday of each month.

• BORDER CITIES CHAPTER, *Ontario, Can., Nov. 7*—This meeting was held at the Purity Dairies Salesroom. President Hamilton was appointed official delegate to the Cleveland convention. Through unavoidable circumstances, W. M. Maybee tendered his resignation as secretary, and H. J. Brough was elected to take his place. On the education program, Ted Jolliffee introduced Fraser Morris of the Universal Cooler Company, who gave a very interesting talk on hermetic units. Following this the second series of educational sound pictures were shown.

• CALGARY CHAPTER, *Calgary, Alberta, Dec. 1*—The meeting was held in the Spanish Room of the Pallister Hotel, and all chapter business was cancelled in order to give all the time possible to the two prominent speakers on the educational program, who were Phil Hedrich, Sales Manager, and Fraser Morris, Service Manager of Universal Cooler Co. of Brantford, Ontario. Mr. Hedrich was introduced first to give an insight into future Universal Cooler plans for production. He stressed the fact that the trend now was for frost-free coils with consequently higher humidities for better preservation of foods. In conjunction with this, germicidal lamps engineered for each application are to be used. Mr. Morris followed with a talk on the Universal hermetic unit which he had hooked up to a transparent coil to illustrate restrictor tube feed and oil circulation. He also explained the type of relay and motor thermal protectors used. After a short question and answer period, refreshments were served to finish the evening.

• CANTON REGIONAL CHAPTER, *Canton, Ohio, Dec. 16*—Election of officers took place with the following results: Carl F. Howenstine, *President;* Leonard Petry, *1st Vice-President;* D. W. Lash, *2nd Vice-President;* Wm. F. Kuhns, *Secretary-Treasurer;* Andrew J. Bing, *Sergeant-at-Arms;* Brooks Frantz, *Educational Chairman.* Board of Directors— C. S. Barnaby, D. C. MacBeth and Homer Essig. A report on the proposed code was given by the President, and Robert Marks was accepted as a Junior member of the chapter during the business session.

The educational program proved to be a very interesting and instructive one, including Paul Domke, M. Pritchard and Carl Shuman of Mueller Brass. Mr. Domke took over as the speaker and held the undivided attention of the audience with his talk which he started on the subject of dryers, displaying cut samples to show construction, etc. Silica Gel was then very thoroughly explained and future improvements noted; the best location for a dryer was discussed, and valves, heat exchangers, liquid indicators, etc. were displayed and likewise discussed. Sweat tees were made and samples of tees not yet finished were shown. The final subject was soldering methods, cleaning fittings and the proper use of Flux.

• CENTRAL NEW YORK CHAPTER, *Syracuse, N. Y., Dec. 4*—This was a special meeting held for the purpose of hearing A. M. Schmitz, District Manager of Servel, who talked on moisture problems, business tactics of servicemen, and the electric circuits of the Servel Supermetic units. A laboratory test model, with Plexi-glass dome, was in opera-

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RESULT? 100% drying efficiency until you use them—greater moisture adsorbency on the line—less frequent servicing of dehydrators.

This costs us time, equipment, labor—but it costs you no more to benefit from this scientifically efficient DFN dehydration. Ask your jobber for DFN Dehydrators. Write us for Catalog R-7.

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tion on the platform so all could view the inner workings. After this very educational and enjoyable talk, coffee and sandwiches were served.

• COLONELS CHAPTER, *Louisville, Ky., Dec. 4*—The entire meeting was taken up by the appointment of committees for, and the discussion of a Christmas party held for members of the chapter and their families.

• COLUMBUS CHAPTER, *Columbus, Ohio, Nov. 12*—Several committees were appointed during this meeting, and Albert Yoe was elected delegate to the Annual Convention in Cleveland, with Harold Mohr, alternate. The educational program that was planned for this meeting could not be held due to illness of the participants, so in its place a quiz contest was conducted. The teams of four members each were chosen—on one side Bill Redd, Irvin Grace, Howard Yost and Ray Strigel—and on the other, Robert Creamer, Harold Mohr, Walter Groezinger and John Wisler. The first team ended with a score of 110 and the second with a score of 120.

• CORPUS CHRISTI CHAPTER, *Corpus Christi, Tex., Nov. 5*—During this meeting, ten applicants who had previously been approved were elected to membership. Considerable discussion was held regarding a forthcoming party and also on the subject of electing a delegate to the Annual Convention. On the educational program, two sound pictures "Quieting a Noisy Refrigerator" and "Making and Repairing Tubing Connections" were shown, after which refreshments were served through the courtesy of Rem Supply and United Refrigeration.

• DAYTON CHAPTER, *Dayton, Ohio, Jan. 8*—This meeting was held at the Allied Supply Co. with a very good attendance. New officers were installed as follows: D. D. Denny, *President;* Edw. S. Mittenholzer, *1st Vice-President;* Robert M. Hoff, *2nd Vice-President;* Delbert R. Goll, *Secretary;* Lee Sunderhaus, *Treasurer;* George O. Snyder, *Sergeant-at-Arms.* President Denny then appointed Jack Homan, Chairman of the Entertainment Committee; Harold Rogers, Chairman of the Publicity Committee; and Paul Hopper, Chairman of the Membership Committee. Since no educational program was planned, an open discussion of service problems was held which proved most interesting.

• DIRIGO CHAPTER, *Auburn, Maine, Nov. 12*—On the educational program, Frederick W. Binns, Chemical Engineer of the Virginia Smelting Co., gave a very fine lecture on refrigerants, bringing out the properties of the Freon group in a very comprehensive manner.

At the December 9th meeting, a nominating committee consisting of Robert Thurston, Wade Hapgood and Robert LeBourdais was appointed by President Daris, who likewise appointed a committee to make arrangements for a forthcoming banquet.

• FAIRFIELD COUNTY CHAPTER, *Fairfield County, Conn., Jan. 14*—Earl Walters presided at this meeting in the absence of the president who was not able to attend due to injuries. On the educational program, Jack Strauss and W. P. Abbott of Detroit Lubricating Company presented an interesting showing of Detroit products. The presentation was so well accepted that the Detroit men were asked to present further showings at the February meeting. The first group of the educational film was then shown, together with a film entitled "The Romance of Glass" through the courtesy of the Pittsburgh Glass Co.

• FLORIDA WEST COAST CHAPTER, *Tampa, Fla., Dec. 11*—After a short business meeting, the Educational Chairman showed training films on pressure actuated devices and controls of a multiple commercial system and on thermostatic controls for commercial applications. Films on big game hunting in Africa were also shown.

• FURNITURE CITY CHAPTER, *Grand Rapids, Mich., Dec. 2*—The following officers were elected at this meeting: Frank Farrow, *President;* J. Markert, *Vice-President;* Francis Buckley, *Secretary;* A. O'Brien, *Treasurer;* R. A. Steffenson, *Sergeant-at-Arms.* A new member of the Board of Directors, Joe Schroeder, was also elected. After this, R. Johnson showed two films—one on the lumber industry and the other on the Hiram Walker Distilleries.

• GRANITE STATE CHAPTER, *Manchester, N. H., Dec. 9*—A delicious dinner, enjoyed by 21 members, preceded this meeting. One of the first orders of business was the election of Elliott Gordon as Sergeant-at-Arms of the New England States Association, following which President Cobe read a humorous article "Twenty-one ways to kill organizations," from the October issue of THE REFRIGERATION SERVICE ENGINEER. J. Almeida of United Motors was the speaker of the evening. His talk covered the cause, effect and correction of most motor troubles found in the field, after which a question and answer period was held.

• GREENVILLE CHAPTER, *Greenville, S. C., Dec. 10*—During this meeting, J. A. Bramlett was accepted into the chapter as an active member. It was decided to start the series of educational films with the February issue, and after discussion of several other chapter business matters the meeting was adjourned.

• HUDSON-MOHAWK CHAPTER, *Schenectady, N. Y., Nov. 17*—Officers elected at this meeting are as follows: William A. Schreider, *President;* Oliver K. Rolf, *Vice-President;* Koss O. Fogg, *Secretary;* Donald L. Heath, *Treasurer;* George J. Gottsche, *Sergeant-at-Arms;* and R. Douglas Marshall, *Educational Director.* Meeting dates were set as the first Tuesday of each month.

At the December 2nd meeting, Douglas Marshall, Educational Director, introduced Messrs. Lamb and Redwood of Dayton Rubber Company, who presented an interesting program of movies and slides on Dayton Belts, their application to industry and refrigeration.

On January 6th, Koss Fogg was elected delegate to the national convention, and Oliver Rolf elected alternate. On the educa-

tional program, William Donovan, engineer of the Heat-X-Changer Co., gave an instructive talk on the application and use of Heat-X-Changers in the refrigeration field.

• INDIANAPOLIS CHAPTER, *Indianapolis, Ind., Nov. 25*—The highlight of the evening was a talk given by Mr. Merkle of Temprite Products Corp., on their coolers and other products. Refreshments were served to wind up the meeting.

At the December 9th meeting, E. W. Wulf was elected delegate to the National Convention and J. A. Salter, alternate. After business matters were completed a drawing for attendance was held and prizes were won by L. Durham and B. E. Hubbard.

• JOPLIN CHAPTER, *Joplin, Mo., Dec. 10*—Thirty-two members were in attendance at this meeting and after the chapter business was completed, Mr. Merkle of Ranco, Inc., presented an interesting talk, after which refrigeration problems in general were discussed.

• KANSAS CITY CHAPTER, *Kansas City, Mo., Dec. 18*—Election of officers was held at this meeting with the following results: Robert S. Huston, *President;* Cecil R. Visger, *1st Vice-President;* F. C. Smith, *2nd Vice-President;* W. Allen Brown, *Secretary;* A. C. Taylor, *Treasurer;* and C. B. Lambert, *Sergeant-at-Arms.* Trustees—F. W. Brown, A. M. Hoover and M. L. Ferguson. The meeting then recessed to convene at the shops of Air Reduction Company where expert welders and brazers put on actual demonstrations of the new process of bonding metals such as used by servicemen.

• LA CROSSE CHAPTER, *La Crosse, Wis., Dec. 5*—Most of the discussion during the business session had to do with the expenses to be allowed the delegate to the National Convention. The educational program consisted of a talk by John W. Hall of Automatic Products Co., Milwaukee, on the subject of the operation, selection, construction and installation of expansion valves, solenoids, strainers and driers. This was followed by a short open discussion period.

• LONG BEACH CHAPTER, *Long Beach, Calif., Dec. 10*—This meeting was devoted to business and no dinner was served. Many topics were discussed and among the most interesting was the report made by Chairman Fred Riley of the Welfare Committee, concerning a blind mother and her thirteen year old son. Coffee and cake, furnished by the Auxiliary, were enjoyed after the meeting.

On Saturday night, December 13, in the Marine Room of the Wilton Hotel, the chapter held its annual Christmas dinner-dance with over 200 in attendance. A delicious dinner was served, followed by the drawings for door prizes and the introduction of distinguished guests, among whom were International President W. W. Allison and his wife and daughter, and Chapter Presidents L. K. Willis of Long Beach, M. R. Hanks of San Diego, James Robinson of Orange County, Everett Brown of Compton, Herb Kaeding of Arrowhead, Clarence Stumph of San Gabriel, Harold McQuay of Los Angeles and Bill Wharton of Oakland. Several headline vaudeville acts were presented, after which there was dancing to the music of Berl Uben and his ten piece orchestra.

• METROPOLITAN NEW YORK CHAPTER, *New York, N. Y., Nov. 28*—The attendance at this meeting was 57 members and 12 guests. Sidney Weiner of Technical Refrigeration Service gave a brief talk and demonstration on a new type cleaning compound for removing sludge from stuck up hermetic compressors. Immediately afterward, J. H. Spence of Hussmann Refrigeration, Inc., talked on the subject of food merchandising, using motion pictures and slides to illustrate. He discussed mainly the open top display cases, bringing out the fact that their use with proper packaging reduces waste in vegetable from 25% to 2 or 3%. Proper running time, placement of dryers and the proper setting of the automatic defrost cycle on these open type cases was discussed at length. It was an extremely educational lecture, particularly to those men present who had not as yet worked on this type of case.

Eight men volunteered for the tube bending contest to be held the next meeting, tubing for which will be donated by Jack Greenlinger of Wholesale Distributors. A beautiful banner was presented to the chapter, contributed by Sam Hammer, Sam Schwartz, Circle Controls, Inc., Aetna Supply Co. and Motors & Armatures, Inc.

• MIAMI CHAPTER, *Miami, Fla., Nov. 26*—During the course of the meeting, Armand A. Masse was welcomed as a new member of this chapter. The educational session was conducted by O. W. Brown, and consisted of questions submitted by the members.

At the December 10th meeting, President Turpin reported that the chapter has one pint of blood to their credit in the Dade County Blood Bank, donated by himself. The following members wished to donate their blood to credit the RSES bank: J. D. Nail, P. E. Ritchie, T. P. Chapoda, R. A. Williams, A. De Boeser, O. W. Brown, P. Connally, C. Sturgis, M. D. Comfort, J. R. Turpin and H. B. Wright. Educational Director O. W. Brown gave some interesting information pertaining to the similarity of F-11 and Carrene. He also lined up a lecture series on electronics for future meetings.

• MIDLAND EMPIRE CHAPTER, *Billings, Mont., Jan. 13*—This meeting was attended by quite a number of out-of-town members including Alan Weaver of Red Lodge and Carl Stav of Bozeman. After a brief business meeting, Norm Sulenes presented a talk and demonstration on the history, manufacture and application of Sterilaire germicidal lamps. Much of the information was supplied by Ultra Violet Products Co. of Los Angeles who were unable to have their representative present. The theme of the talk was "Mr. Service Engineer, sell food storage insurance with germicidal lamps." A lengthy open forum was conducted on the subject, after which refreshments were served.

• MOUNT ROYAL CHAPTER, *Montreal, Que., Dec. 18*—Applications of R. J. Kerr, Ken Martin and Rolland Brossoit were accepted at

this meeting. The following were elected as officers for 1948; Mac Turner, *President;* Nap Brossolt, *1st Vice-President;* Bob McCullough, *2nd Vice-President;* John Sharples, *Secretary;* Jean Paul Delage, *Treasurer;* A. J. Briffet, *Sergeant-at-Arms;* Dave Greenberg, *Entertainment;* Art Brown, *Education;* Kenny Martin, *Membership;* and J. A. St. Laurent, *Auditor.*

• NIAGARA FRONTIER CHAPTER, *Buffalo, N. Y., Dec. 12*—This meeting was devoted entirely to chapter business, and one of the matters decided upon was the appointment of Bill Goeckel as delegate to the convention in Cleveland, and Eddie Orsolits as alternate.

On December 21st the chapter held their annual children's Christmas party. Refreshments were served and each child received a box of candy. Entertainment included a roller skating act by Mr. Good and two of his pupils, and a dance act by ten small girls. Bert Miller officiated as Santa Claus and Mr. McCormick was dressed as Bunny Rabbit, much to the amusement of all the children present.

• ONTARIO MAPLE LEAF CHAPTER, *Toronto, Ont., Dec. 19*—A. E. Doan, Educational Chairman, presented the speaker of the evening who was Dr. Misener of the University of Toronto. His address entitled "Heating with Refrigeration" was very interesting and prompted many questions from the members and guests present. Immediately afterward, W. Smallwood explained the new excise tax from first hand information. H. F. Nye held the drawings for the Christmas fowl.

• PENINSULA CHAPTER, *Newport News, Va., Dec. 11*—Educational Director E. Zepkin took over the program after a short business meeting and introduced the guest speaker of the evening, E. V. Dunbar of Ranco Control Co., Atlanta, Ga. Mr. Dunbar gave a brilliant and educational lecture on the products of his company, from the first control manufactured by Ranco up to their latest piece of equipment—the new two temperature control which requires no changes in any existing systems to install. Mr. Dunbar stated that in the near future all power elements would be constructed of beryllium. After his lecture Mr. Dunbar presented several lucky members with prizes for answering questions put to them. Prize winners included R. L. Sealey, L. E. Causey and D. Biggins.

• PHILADELPHIA CHAPTER, *Philadelphia, Pa., Nov. 28*—By unanimous vote, all present officers were nominated for the next year, so they might continue with their plans for rebuilding the chapter. The meeting was then turned over to H. A. Chandler of the McIntire Connector Co. who introduced L. S. Dunn, President of his company. Mr. Dunn's talk was followed by a question period, after which H. C. Hoover, Philadelphia representative of Kold-Hold and McIntire, was introduced. Mr. Hoover held the undivided attention of the audience for about an hour with his most interesting talk. Although this meeting was held the night after Thanksgiving (usually considered a bad night for a meeting) 76 members and guests present at this meeting found it to be a very good night and one well spent.

• SACRAMENTO VALLEY CHAPTER, *Sacramento, Calif., Dec. 4*—This meeting was attended by 25 visitors from Sacramento and surrounding towns—as far north as Chico and south as far as Stockton. President Schoen introduced the evening's speaker, Tom

Taken at the November 28th meeting of the Philadelphia Chapter, the above group picture shows, left to right, Chapter Secretary Jim Keers; President Bob Keil; Vice-President Bill Waite; of the evening.

L. S. Dunn and H. A. Chandler of the McIntire Connector Co. Mr. Dunn was one of the speakers In the photo to the right, H. C. Hoover, another one of the speakers, is explaining the construction of a Kold-Hold plate evaporator.

Davenport of the Alco Valve Co., who gave an educational talk and demonstration on Alco valves.

• ST. LOUIS CHAPTER, *St. Louis, Mo., Dec. 16*—Those elected at this meeting to serve as officers in 1948 are as follows: Sam Wolff, *President;* Harry Menaugh, *Vice-President;* R. S. Detweiler, *Recording Secretary;* Bill Matejka, *Corresponding Secretary;* Ralph Appel, *Treasurer;* George Eatherton, *Sergeant-at-Arms.* Board of Directors—Roland Vizgird, Chairman, Adolph Braun, Otto Tinkey, Leonard Voliman, George Becker and Joe Pedrotti.

• SOUTHERN TIER CHAPTER, *Elmira, N. Y., Dec. 18*—Officers elected at this meeting are: Charles Clay, *President;* Jack Bilson, *1st Vice-President;* Donald Adair, *2nd Vice-President;* Edward Dailey, *Secretary;* Daniel Mahar, *Treasurer.*

• SPRINGFIELD, ILL. CHAPTER, *Springfield, Ill., Dec. 19*—This was a combination meeting and Christmas party held at St. Nicholas Hotel. During the short business session the following officers were elected to serve for the coming year: Charles J. Fox, *President;* J. G. Stark, *1st Vice-President;* H. D. Hummer, *2nd Vice-President;* J. K. Farrelly, *Treasurer;* F. C. Meador, *Secretary;* Leonard Roos, *Sergeant-at-Arms.* A banquet dinner was served to about twenty-five members and their wives. During the evening cards were played and prizes were awarded for the highest and lowest scores. Gifts were also drawn from a grab-bag. Mrs. Dobbins of the U. S. Electric Co. donated a beautiful set of hurricane lamps for the door prize. Everyone had a very enjoyable evening. The committee, consisting of Dick Potter, Charles Theobald and J. J. Kline are to be commended on their arrangements.

• SPRINGFIELD, MO. CHAPTER, *Springfield, Mo., Dec.*—This was a banquet attended by ten members and their wives and five visitors. Robert R. Meuer of the Ansul Chemical Co., one of the visitors, made a very interesting speech on refrigerating gases, and several chapter members gave short talks on the progress and accomplishments of the chapter.

• TOLEDO CHAPTER, *Toledo, Ohio. Dec. 10*—Business conducted at this meeting included the election of officers and it was unanimously decided that last year's officers be re-elected. Officers for next year, therefore, are William Foster, *President;* John Horvath, *Vice-President;* Fred R. Dennis, *Secretary;* Mark L. Dennis, *Treasurer;* Donald Orimsby, *Sergeant-at-Arms.* A door prize was raffled off before the meeting adjourned.

• TRENTON CHAPTER, *Trenton, N. J., Dec. 17*—After all committees had been called upon for reports and unfinished chapter business was completed, the election of officers took place with the following results: Lewis P. Ischinger, Jr., *President;* Franklyn Beemish, *Vice-President;* George Wood, Jr., *Secretary;* William Funkhouser, *Treasurer.* Board of Directors—Henry Guear, George Frie and John Saim. The meeting was then turned over to Mr. Gunther of the Margun Hardware Co., who presented a brief but interesting talk and demonstration on the use of the brazing alloy known as "Phosco." The 50-50 Club drawing was won by Don Beliviso.

• TWIN CITIES CHAPTER, *Minneapolis, Minn., Dec. 2*—The following officers were elected at this meeting: William H. Hanson, *President;* William Mahnke, *1st Vice-President;* Ray Bladorn, *2nd Vice-President;* Les Ost, *Secretary;* Milton Swanson, *Treasurer;* Glen Schwarting, *Sergeant-at-Arms.* Board of Directors—Edward Asproth, Dean Holmes and Art Palen. To stimulate attendance, a Telephoning Committee with Dean Holmes as Chairman was appointed, to telephone members keeping them advised of special and regular meetings.

• WESTERN MASSACHUSETTS CHAPTER, *Springfield, Mass., Nov. 25*—The educational portion of this meeting was an interesting talk given by Al Schmidt of Servel, Inc., on their products. This was thoroughly enjoyed by the 29 members present. Mr. Schmidt was also kind enough to make a donation toward the Christmas fund.

December 8—Twenty-seven members at this meeting enjoyed a talk and demonstration given by Mr. Micklejohn of Elpeco Mfg. Co., on DFN dehydrators and a moisture indicator.

• WOLVERINE CHAPTER, *Lansing, Mich., Dec. 8*—After the business meeting, an interesting motion picture on the various products of the Shell Oil Company was shown by Mr. Boyer. The December 22nd meeting was devoted entirely to business.

LADIES AUXILIARY

• KANSAS CITY AUXILIARY, *Kansas City, Mo., Nov. 20*—During the business meeting, Mrs. Edna Visger was named delegate to the National Convention and Mrs. Frank Brown, alternate. A raffle gift—a brass swinging flower pot—donated by Mrs. Allan Brown was won by Mrs. A. C. Taylor. On the drawing for high and low numbers, first prize of a plastic flower pot and saucer were won by Mrs. Frank Brown and the second prize, a pair of plastic placques, were won by Mrs. Stodgell. Coffee and hot dogs were served to the approximately 45 ladies by Mrs. Hoover, Mrs. Allan Brown and Mrs. Ferguson.

At the December 18th meeting, the following officers were elected for 1948: Mrs. A. M. Hoover, *President;* Mrs. A. C. Taylor, *Vice-President;* Mrs. C. R. Visger, *Secretary;* Mrs. Frank Brown, *Treasurer;* Mrs. R. A. McCullough, *Sergeant-at-Arms.* Board of Directors—Mrs. M. L. Ferguson, Mrs. Robert Huston and Mrs. Leo Stodgell.

• NIAGARA FRONTIER AUXILIARY, *Buffalo, N. Y., Dec. 12*—The election of officers was held at this meeting with the following results: Mrs. Leon McCormick, *President;* Mrs. Walter Bobzien, *Vice-President;* Mrs. A. H. Keirn, *Secretary;* Mrs. Wm. Goeckel, *Treasurer;* Mrs. Ed. Orsolits, *Sergeant-at-Arms.* Board of Directors—Mrs. Thomas Jordan, Chairman, Mrs. Chester Schintzius, Mrs. Bert Miller, Mrs. John Muller and Mrs. Harold Swan. The Dress Club drawing was won by Mrs. Goeckel.

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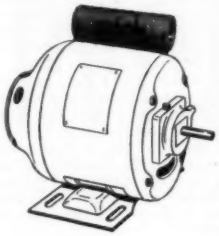

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Jefferson Electric Company, Bellwood, Illinois
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Please send Bulletin 16-1 which contains complete details on Capacitron Motor Starting Capacitors.

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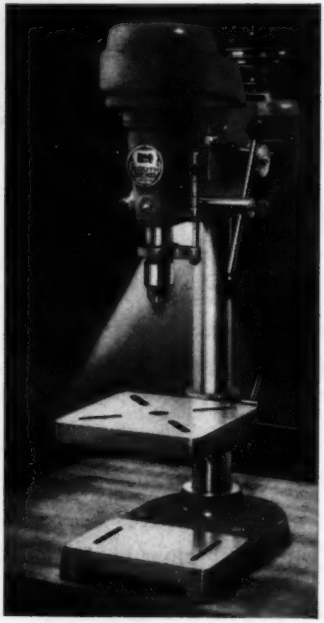
NEW AND IMPROVED EQUIPMENT

Information in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

Drill Press

A NEW 14" Precision Drill Press has been announced by the South Bend Lathe Works, South Bend, Indiana. The manufacture of a drill press is a departure for this company, which has manufactured precision lathes exclusively for over 40 years. Designed by the same engineering staff and produced with the same excellent manufacturing facilities employed in the production of the well-known line of South Bend Precision Lathes, the drill press is the result of several years of careful research, thorough testing, and improvement. Both bench and floor models are now in production. Most specifications are common to both models, each having a capacity to drill ½" in iron or steel at the center of a 14" circle. Rugged construction assures lasting precision and durability.



Being a completely new design, this drill press introduces several original features which add to convenience and ease of operation. A built-in light with independent switch provides shielded illumination for the work area, eliminating the necessity of installing a separate lighting fixture. A quick-acting belt tension release lever simplifies changing the spindle speeds and returns the vertical mounted motor to its original position after each change, thus maintaining the same belt tension for each of the four cone pulley steps.

The spindle has a maximum travel of four inches, with spindle speeds of 707, 1305, 2345 and 4322 r.p.m. The free-floating spindle design prevents misalignment, side thrust and whip. The depth gauge is graduated in sixteenths of an inch, and has adjustable collars to control both the depth of feed and the length of the return stroke. Two precision ball bearings carry the drive unit load and two additional ball bearings carry the spindle, which is spline driven. All ball bearings, being pre-lubricated and sealed, require no oiling. The spindle quill bearing has adjustment to compensate for quill wear.

A full tilt type table, with 10"x10" precision ground top surface, has slots for clamping fixtures or work. An improved type of double plug binder is provided for locking the table quickly and securely in any position on the 2¾" diameter column.

Additional information can be obtained from the South Bend Lathe Works, 207 East Madison Street, South Bend 22, Indiana, U. S. A.

Gammeter

A NEW instrument that should prove invaluable to the refrigeration service industry has just been announced by Gamma Electric Co., 1523 41 St., Brooklyn 18, N. Y. It is a combination unit starter, analyzer, and ammeter. This instrument is designed to quickly start and test hermetic and open type units, with special emphasis placed on the value of current measurements in determining the actual condition of a unit. A double range precision ammeter is the indicating device employed for this purpose.

The Gammeter is compact, portable and provides direct manual starting of unit, bypassing the relay. It thus isolates a defective relay. It measures the current drawn by the run winding or the start winding or both, whether rotor is rotating or at rest. These current readings are extremely useful in determining whether windings are normal or whether shorts are present. In addition, comparison of current readings with and without compressor coupled to motor (in open type units) provides a measure of the efficiency of the compressor.

The location of grounds and open circuits is a matter of a few seconds when operating the snap-action controls on the Gammeter. The manufacturer feels that in this versatile instrument, the modern service man has something that will save him time and money.

Leak Detector

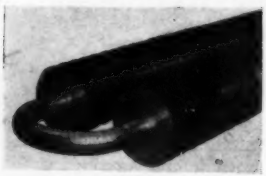
A NEW leak detector for refrigeration units has been announced by the Justrite Manufacturing Company, Chicago. This new unit—the Justrite Leak Detector Outfit, Model 1240—is designed to burn alcohol.

This leak detector is reported to be a compact unit designed primarily to locate leaks in refrigeration systems using halide gases. And this model may also be used as a soldering iron and as a blow torch — soldering point and flame reducer are included in the outfit.

In general appearance and construction, it is identical to the Justrite Gasoline-Operated Leak Detector which has been on the market for several years. The height of the unit is 11 inches and the weight is only 1¾ lbs. It is cylindrical in shape—the handle enclosing the fuel tube being constructed of bakelite. The brass burner tube accommodates the removable flexible metal leak detector hose. The only moving part on the torch is the regulating valve knob. This leak detector reportedly develops 140 lbs. pressure at 1800 F. to 1900 F., and burns between 20 and 45 minutes on 1½ oz. of fuel.

Coils

A REFRIGERATION coil with disc fins is a new product of the Howe Ice Machinery Company, Chicago. Trademarked the Polar Circle Disc Fin Coil, its advantages include savings in space required, weight to be handled, labor involved in hauling and



installation, and finally, in the amount of refrigerant needed to provide a given service.

In construction, the 7″ diameter fins of 16 gauge steel are united, 1½″ apart, with 14 gauge steel tubing of 2″ overall diameter, by a specially Howe designed machine which expands the tubing into the fins. With a perfect bond thus assured, the entire coil is then hot galvanized.

The coil is made in three standard lengths—8′6″—10′6″—and 12′6″ overall—to provide combinations to fit a room of any size. Coils are furnished with plain ends, welded "U" or hair pin bends, with square or oval flanges, or couplings, welded to the tube.

Numerous installations made by the Howe organization during a two year experimental period show refrigerant savings of upward of 50%. One lineal foot of the Polar Circle Disc Fin Coil provides refrigerating surface equal to eleven feet of 1¼″ pipe and has only one-third the weight of prime pipe surface of equal capacity. Labor savings resulting from handling of only one-tenth the lineal feet of coil, and one-third the weight can easily be visualized.

The new coil is especially designed for heavy duty in commercial and industrial coolers and freezers.

Sealer Compound

A NEW improved sealer for use in the insulation of refrigerated equipment to keep vapor and moisture-laden air from the insulation space has been developed and placed on sale by the Armstrong Cork Company. Called Armstrong's Sub-Zero Sealer, the new product is resilient, moisture-and-vaporproof, and sufficiently pliable to resist normal impact and torque action.

The new sealer may be used in all-steel construction where it is poured along the welded seams and under the breaker strips. In combination wood and steel construction, it is poured along the joints where the wood and steel meet. A hot type sealer is considered essential for equipment operating at 0 F and lower.

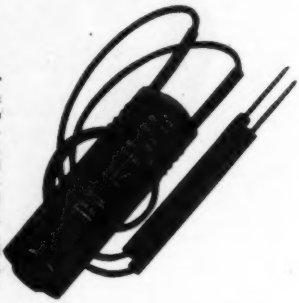
The new product has a melting point of 240 to 260 F. At —10 F. a 1/16″ film of Armstrong's Sub-Zero Sealer on 30-pound kraft paper can be bent slowly around a 1″ mandrel without cracking.

The new product's physical characteristics make it advantageous in the manufacture of commercial types of refrigerated cabinets. It will not flow when the finished equipment is made, stored, or shipped during high summer temperatures, and it will not crack where shipment or storage might be required where winter weather drops temperatures to 25 F below zero.

Armstrong's Sub-Zero Sealer is odorless and can be used on food cabinets without any possibility of tainting. It will bond tightly to wood, metal, Temlok, corkboard, glass, and other materials.

Voltage Tester

IDEAL Industries, Inc., 1093 Park Avenue, Sycamore, Illinois, announce a new Voltage Tester for testing continuity of circuits (AC or DC), 110 to 550 volts AC, 110 to 600 volts DC, blown fuses, grounded side of line, grounded side of motor or appliance, excessive leakage to ground, frequency (25 or 60 cy.) and DC polarity.



This new Tester eliminates the possibility of error and danger present when using the old-fashioned test lamp. Indications are by a solenoid indicator and a neon test lamp. This gives double protection—each operates independently of the other. Securely anchored 2′ leads are brought out through top of case, which makes it easy to handle and easy to read.

The IDEAL Voltage Tester is sturdily constructed and encased in an attractive, streamlined, plastic case. Has easy-to-read scale calibrated from 110 to 600 volts. Overall length is 6″. Leads are 2′ long.

Torch

OVER 8 full hours burning time, 3800 F. operating flame, filling costs of less than 2¢, hand-size convenience . . . these are some of the features of the Crown Torch, completely self-contained heating torch which burns Butane or Propane gas.

The Crown Torch is designed for all soldering, brazing, and heating operations. Uses include sealing sweat joints, lead burning, light brazing, radiator soldering and repairing, sealing batteries, thawing frozen pipes, paint burning, soldering of copper pipe, radio and armature repairing, leading bodies and fenders, silver soldering, heating and bending, cable splicing, heating and forming composition floor tiles, and many others.

Plumbers, electricians, automotive repairmen and mechanics, welders, refrigeration engineers, sheet metal workers, radio repairmen, radiator repairmen, painters, home mechanics and others will find that the Crown Torch meets every specific torch requirement.

Made of 16 gauge seamless brass tubing scaled by furnace brazing, the Crown Torch has a pressure capacity of over 2200 psi. Operating pressure with Butane and Propane gases is 90 to 150 psi. The Crown Torch tests well within the safety specifications of the API and ASME.

The Crown Torch is 12 inches long, 2¼ inches in diameter, and weighs 2½ pounds when full. Free from the large, heavy tanks, tangling hoses, and numerous tips required for small acetylene equipment, the Crown Torch is the only heating torch that has small tool convenience.

Other features include fingertip control of flame size and temperature, patented "all-in-one" tip which eliminates need for tip changes, 100% Btu. efficiency, and easy filling operation. The Crown Torch can be filled from any standard Butane or Propane tank.

Air Conditioner

A NEW five-ton capacity packaged air conditioner, designed especially for stores, restaurants and business houses, is being produced by Frigidaire Division of General Motors.

Occupying only seven and one-half square feet of floor space or about half of that required by an ordinary office desk, the new packaged conditioner is completely self-contained. The refrigerating unit, electric motors, cooling coils and fans are housed in a single steel cabinet.

Flexibility, low-cost installation and portability are principal advantages of the new packaged unit. These conditioners may be used in multiple to air condition an entire building, a series of floors, a single floor or any large area. On the other hand, a single unit will serve several office rooms, a department or smaller sections of a floor. The conditioner can be used from a remote position by employing a simple duct system. The five-ton unit is particularly well-suited for buildings constructed without provision for air conditioning systems.

Psychrometer

AN ELECTRIC humidity measuring device, believed to be the most accurate yet developed for commercial and scientific use, has been announced by the Minneapolis-Honeywell Regulator Company.

Reading temperature deviations within one-fifth of a degree, the motor-driven instrument uses matched wet and dry bulb thermometers with scale readings from 40 degrees to 120 degrees Fahrenheit, G. M. Kingsland, manager of the company's specialty division, said.

Included with the instrument is a large and specially prepared psychrometric chart so that the wet and dry temperature readings may be translated into precise relative humidity percentages.

Called an aspirating psychrometer, Honeywell's new device could be used as a standard check for other humidity instruments.

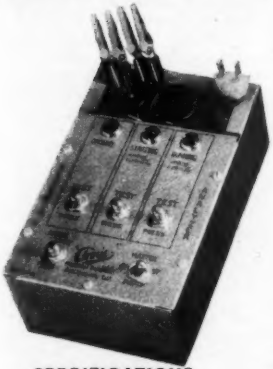
The complete instrument, in addition to the psychrometric chart, includes a wick, thread, scissors, a bottle of distilled water, carrying case, and—if desired—an adapter over the thermometer bulbs of the matched thermometers so a tube could be inserted into an enclosure, such as duct work, thus obtaining humidity readings by drawing the air from the enclosure by use of the fan of the psychrometer itself.

Sun Oil

TO AID in servicing small refrigeration and air-conditioning equipment, Sunlso "G" Refrigeration Oils, produced by Sun Oil Company, are now available in one and five-gallon containers.

The new, small packages minimize the risk of moisture absorption, which formerly took place when drums were stored for long periods and were constantly re-opened. Service organizations may obtain Sunlso "G" Refrigeration Oils in the new containers from local refrigeration supply houses.

MORE PROFIT—LESS TIME



ANALYZE HERMETICS WITHOUT GUESSWORK

Let Annie Do It!

HERE IS A HERMETIC UNIT ANALYZER which, in a matter of seconds, will positively indicate the nature of any electrical defect.

SPECIFICATIONS
Size: 3" x 5" x 8"
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Price: **$16.50**

Annie

- REVERSES DIRECTION OF RUN
- PROVIDES MANUAL STARTING
- INDICATES OPEN OR GROUNDED FIELDS
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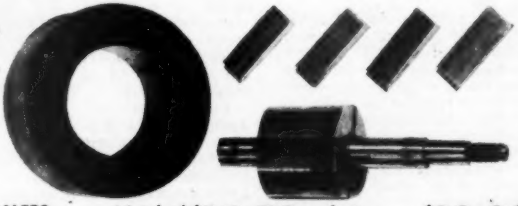
A "must" in any repair kit. Be sure you have it. Don't be embarrassed by your customer asking: "How do you know?"

COLDSPOT REPLACEMENT COMPRESSOR PARTS . . .

A complete set of matched parts ready to assemble into the original housing—designed to fit all Coldspot compressors having 15/32 inch shafts.

SPECIFICATIONS
All wearing surfaces are tool-hard.
Available in 3 sizes—
1" — 1¼" — 1½"

MATCHED SET INCLUDES:
1—Rotor
4—Vanes
1—Cylinder



SOLD THROUGH LEADING WHOLESALERS. ORDER FROM YOUR REGULAR SUPPLIER, OR SEND DIRECT INCLUDING HIS NAME.

Matched Set Each **$14.50** Lots of 3, each **$13.80**

MECHANICAL ENTERPRISES DEPARTMENT 36

4856 LANKERSHIM BLVD. NORTH HOLLYWOOD, CALIF.

G.E. Refrigerator

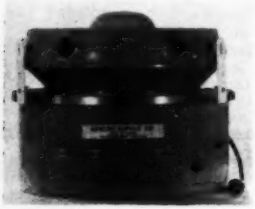
A BUTTER conditioner, a device introduced by General Electric before the war to keep butter at smooth spreading temperature, is incorporated in the improved model of the Company's deluxe 8-cubic-foot refrigerator which has been announced by L. H. Miller, manager of the G-E household refrigerator division.

Built into the left wall of the refrigerator, the conditioner holds a pound of butter. Its use in the new refrigerator, designated the NF-8, represents its first appearance in the Company's postwar refrigerator line.

According to Mr. Miller, the NF-8 is now being shipped from the Erie, Pa., factory. It carries a recommended national retail price of $299.75.

Humidifier

THE Abbeon Supply Company, Woodside, New York, distributors for the Walton Laboratories, Inc., announces production of the New Walton Industrial Humidifier.



This new humidifier is different from the Standard Walton Industrial Humidifier (which has been in industrial use for a number of years.) Waltons require no steam, no pumps, no compressors, are noiseless in operation and completely self-contained and atomize moisture in a vapor form finer than cigarette smoke.

In the new model the lower pan is now completely covered and the air is brought in from the botton through a fiber-glass filter. This equipment is calculated to save 90% of the cleaning time. Equipped with hanging brackets, the unit is easily installed; all that is necessary is to hang from the ceiling and run a single water pipe to the unit. No return waterline is needed. Automatic controls for close regulation of percentages of relative humidity are also supplied.

A few of the physical details of the new Walton Humidifier are as follows: (1) Vaporization capacity over one gallon per hour. (2) Water supply—no special water is needed as connection is made directly with any water line. (3) Directional domes—360° or 2 directional or single directional domes can be supplied. (4) Ball bearing motors draw less than 100 watts per unit (direct current can be supplied where needed), costing to operate about 50¢ per month per unit. (5) Everything in unit is made of heavy gauge copper or other nonferrous material.

Pyroply

DEVELOPMENT of fire-resistant paneling that protects human flesh within one inch of fire 2,200 degrees hot was announced recently.

Expected to reduce aviation fire hazards substantially and to have many other uses, the new panels are made of specially treated Du Pont "Strux" cellular cellulose acetate plastic sandwiched between sheets of extremely thin (0.006 inch) carbon steel. Test panels are one-quarter inch thick. They are so light—less than a pound per square foot—that a small child could lift a large section, yet they have the strength to support the weight of a large man.

Civil Aeronautics Authority specifications for airplane firewalls require material to withstand applied heat of 2,000 degrees Fahrenheit for a period of 15 minutes. In official tests, the new steel and plastic paneling withstood applied heat in excess of 2,200 degrees Fahrenheit for more than 30 minutes.

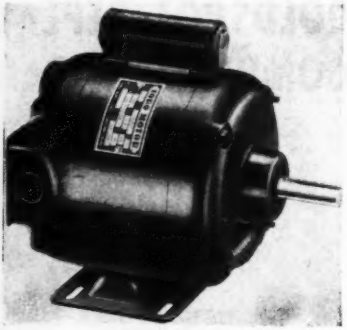
At the end of the test period, the hand could still be held comfortably less than an inch from the panel on the side opposite from the fire.

Further unofficial tests have shown that the paneling stands up after more than an hour of exposure to a 2,000-degree flame.

An idea of the intense heat withstood by the panel can be obtained by comparing it with the temperature of the hottest cooking oven, which is about 550 degrees F.

New Motor

TRIPLE seal windings, having high torque starting characteristics are a feature of the new line of type CSI capacitor start, fractional horsepower motors announced by the Torq Electric Manufacturing Corporation, 1096 Interstate St., Bedford, Ohio. The rotor is of all welded, pure copper bar construction. According to the manufacturer, these engineering features provide for a low starting current combined with high starting torque. These motors are of splash proof design, have sturdy steel frames and die cast aluminum alloy end bells and cast-in terminal for easy wiring. Either solid or resilient bases are offered, slotted



for easy belt adjustment. Frame ratings of 1/6, 1/4, 1/3 and 1/2 horsepower, single phase, 60 cycle, 115-230 volt can be supplied, with heavy duty precision sleeve bearings or ball bearings. These motors are particularly adaptable to such applications as conveyors, stokers, pumps, compressors, etc., where high starting torque, heavy loads and long service are required.

NEWS OF THE EQUIPMENT INDUSTRY

MILLIONTH MOTOR ROLLS OFF J & H ASSEMBLY LINES

THE millionth motor produced by Jack & Heintz Precision Industries, Inc., Cleveland, Ohio, rolled off the company's Berea Road Plant assembly lines January 9, Reber C. Stupp, Vice President in Charge of Production, announced recently.

The achievement climaxed a record of persistent production progress which enabled Jack & Heintz in 1947 to exceed its 1946 output of fractional horsepower electric motors by almost 800 per cent. Motor production in 1947 totaled 885,946, against a 1946 aggregate of 102,697.

The millionth motor produced by Jack & Heintz Precision Industries, Inc., Cleveland, Ohio, is proudly presented by Reber C. Stupp (second from right), Vice President in Charge of Production, to Edward R. Legg (second from left), Vice President in Charge of Sales, as Frank R. Kohnstamm (left), General Sales Manager, Harold W. Melampy (center), Superintendent of the Electric Motor Division, and Robert J. Ginn (right), General Superintendent of Production, look on.

The 1,000,000th motor was processed precisely like the 999,999 which preceded it. There was no suspension of manufacturing operations to allow for completion ceremonies, and work on the second million proceeded without interruption under the direction of Harold W. Melampy, Superintendent of the Electric Motor Division.

Jack & Heintz Precision Industries entered the electric motor field in May, 1946, originally producing only special application ⅓-horsepower models. Shortly thereafter, it expanded its line to include ⅙-, ¼-, and ½-horsepower motors and began a steady production rise.

Today, in its Electric Motor Division, the company manufactures 60-cycle split-phase and capacitor-start motors, 50-cycle motors for the export trade, oil-burner motors, washing machine motors, and special application motors, serving industrial customers throughout the world. In addition, every open-type refrigeration condensing unit produced by Jack & Heintz is equipped with a J. & H. fractional horsepower electric motor.

* * *

DUPONT PUZZLED BY CHARGES OF MONOPOLY

THE Du Pont Company issued the following statement recently:

The Antitrust Division of the Department of Justice has brought suit against the Du Pont Company charging monopolistic practices in the making and selling of cellophane. The Du Pont Company not only denies the charges of violation of the antitrust laws but is unable to figure out who stands to benefit from the government's action.

Ever since it was first produced by Du Pont in this country in 1923, cellophane has had to fight for acceptance against the competition of metal foils, waxed papers and other plastic films. By granting licenses under its patents to the other American producer of cellophane, Du Pont has made it possible for its competitor to expand.

In the course of establishing the present position of this product in the market Du Pont has greatly improved its quality, has created jobs through increased production and has made 21 price reductions from the original price of $2.65 a pound to the current price of 42 cents a pound.

It is true that there is not enough cellophane today to meet the demand. How this suit will remedy that condition is not clear for the field is open for anyone who is will-

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Your Kerotest Wholesaler is our representative in your locality as truly as a branch of our own plant. He carries a comprehensive stock of the entire Kerotest Refrigeration Valve and Fittings line and he is up-to-date on the latest "know-how."

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Take advantage of the prestige Kerotest lends to your jobs. Every installation . . . every replacement made with genuine Kerotest Valves and Fittings identifies you as a craftsman who knows and uses the best. For every refrigeration problem . . . for every need . . . see your Kerotest Wholesaler! Kerotest Manufacturing Company, Pittsburgh 22, Pa.

KEROTEST

First with the Latest in Valves . . .

ing to risk the large plant investment which this business requires.

In addition to work now in progress to increase cellophane capacity Du Pont has been planning to make further investment to expand its facilities to take care of the current demand. The present suit, details of which are not yet available to us, may question Du Pont's right to go ahead with such expansion so necessary to users of cellophane.

AMINCO TAKES OVER AMERICAN INJECTOR PRODUCTS

FORMATION of Aminco Refrigeration Products Co. to take over the refrigeration division of American Injector Co. has been announced by E. "Ed" Kellie and John L. Trix.

Ed Kellie is president of the new organization while John Trix serves as secretary-treasurer.

In effect, the refrigeration division of American Injector is now being operated by Aminco Refrigeration Products Co.

Guarantees and warranties on the American Injector line of products will continue in force without interruption, officials of the new firm announce.

The new company has moved into new quarters at 14544 Third Ave., Detroit 3, where it will maintain offices, manufacturing and shipping facilities, and conduct developmental work.

Kellie, president of the new firm, has been associated with the refrigeration industry since 1919, and had been with American Injector Co. since 1935 when he took charge of engineering. In 1938 he became sales manager of the refrigeration division, and in 1941 was elected vice president. He is a member of the American Society of Re frigerating Engineers, the Refrigeration Service Engineers Society, and the Engineering Society of Detroit.

John Trix has also been associated with American Injector, starting in engineering in 1937. He became secretary of the company in 1941 and served also as assistant factory superintendent.

BANKRUPTCY PETITION FILED IN U.S. COURT BY MILLS INDUSTRIES

MILLS Industries, Inc., Chicago manufacturer of vending machines and other equipment, filed a petition under the bankruptcy laws in Federal District Court recently asking an extension of time for payment of debts.

Atty. Alex. H. Dolnick, one of a group filing the action, said all debts would be paid in full, but explained the company is "having difficulties meeting obligations as they come up, partly because of post-war reconversion."

The petition lists assets of $9,117,021 and liabilities of $13,971,642, including unpaid federal and local taxes of $285,632 and wages due employes of $163,400.

AIRSERCO DROPS PRICES

BECAUSE of increased demand and larger production runs, the Airserco Mfg. Co., Inc., announces a reduction in price of the Airserco Thermostatic Control Tester, Cat. No. 3100, from $19.50 to $16.50. Thousands of the Testers have been shipped to all parts of the world, reports Mr. Williams of the company.

Also reduced in price, is their solid copper Carrene Meter. This product has a special Airserco feature of a replaceable silica gel charge and is reduced in price from $15.00 to $13.75.

BECHAUD BECOMES VICE PRESIDENT OF BEN-HUR

AT A meeting of the Board of Directors of the Ben-Hur Mfg. Company, Milwaukee, A. B. Bechaud, sales manager, was elected to the position of vice-president of the company, according to an announcement from Herman Uihlein, president of the firm.

The Ben-Hur firm manufactures farm and home freezers in several sizes and a new home electric refrigerator.

Mr. Bechaud, a native of Fond du Lac, Wisconsin, organized Ben-Hur's freezer department in 1943 and developed the nationwide sales organization starting at that time.

It was at his insistence that the elaborate test rooms, simulating every conceivable climatic condition be installed, so that his sales force knew exactly what the Ben-Hur farm and home freezers would do regardless of wherever they were installed and used. In addition to these climatic test rooms, Mr. Bechaud has set up a large pre-shipping test department. Here the boxes are put on twenty-four hour performance test, before they are shipped, and as they come off the large assembly lines a record is kept of every phase in the operation of each freezer.

GENERAL CONTROLS APPOINTMENTS

GENERAL CONTROLS CO., Glendale, Calif., announces the appointment of Don S. Bentley as factory branch manager of the Los Angeles branch; F. E. Weldon as factory branch manager of the New York office; and C. G. McCarthy as their Detroit factory branch manager.

S S S

BRUNNER SALES REPRESENTATIVES MEET AT UTICA

AS A fitting conclusion to the biggest sales year in Brunner's 42-year history of continued growth, their field representatives gathered in Utica for a series of business meetings and inspection trips prior to launching the 1948 program of meeting all distributors and bringing them up-to-date on design and application developments plus the advantages of expanded manufacturing facilities.

In opening the conference, A. G. Zumbrun, Executive Director, pointed out that ". . . in the past six years manufacturing floor space has been doubled and the latest developments in precision production machinery have been and will continue to be installed as made available. No expense has been spared toward maintaining Brunner's reputation for building the finest known air compressors and refrigeration units; whose popularity, in no small part, is due to the sincere and wholehearted cooperation by you gentlemen with Brunner distributors the world over."

Most interesting to the sales force was the trip through the company's research department where working models of new developments, yet to be announced, were put through their paces. As explained by General Sales Manager J. Watson Thomas, "Our research and engineering departments have also been expanded and all developments will be thoroughly tested under actual working conditions and over a proving period of time before release of new designs or incorporation in existing units."

In addition to Brunner's acceptance in American markets, they have shown a corresponding growth in foreign trade as evidenced by the fact that well over 100 distributors representing nearly every important country have visited the factories within the last 12 months.

BRUNNER REPRESENTATIVES WHO MET RECENTLY IN UTICA

Back Row: Left to Right—Elmo Burlingame, upper New York; Clayton Burlingame, upper New York; Robt. Smith, Southwest; George Mathews, Metropolitan New York; Franklin G. Slagel, Pacific Coast; Wm. Cashin, New England; Walter McDaniel, Southwest; Fred Murray, Canada; Hugh Davis, Canada; Howard Parker, Canada. Second Row: T. J. Lyon, Chicago; Frank Carryl, Southeast; Larry DeMarsh, Kansas City and South Central States; Jack Junkin, Minneapolis and North Central; Steve Hanna, Pittsburgh and Cleveland; Frank Wilson, Pennsylvania; John Karl, Export; John Denholm, Metropolitan New York; E. H. Schiller, Purchasing. First Row: H. S. Ormsbee, Jr., Export; Jeff Reid, Iowa and Nebraska; A. G. Zumbrun, Executive Director; J. W. Thomas, General Sales Manager; Bart Fleming, Baltimore and Washington; L. B. Menard, Cincinnati.

"RECOLD" DISTRIBUTOR FOR SOUTHEASTERN TERRITORY

W. LES WERNER has been appointed to act as an exclusive "Recold" distributor in the Southeastern section of the country. Werner will operate under the name of Werner Refrigeration Products and will cover the states of North Carolina, South Carolina, Georgia, Alabama, and Florida.

For more than fifteen years he has been actively engaged in the refrigeration field, having been connected with Kelvinator and Universal Cooler Corporation, as a distributor supervisor and later as a district factory manager in Canada.

He is an associate member of the American Society of Refrigeration Engineers, and is also a member of the Refrigeration Service Engineers Society.

As a "Recold" distributor he will work closely with Sterling F. Smith who is direct factory representative for "Recold" covering the territory in which Werner will operate.

YANTIS WITH HENRY VALVE

ROY C. YANTIS has joined the Henry Valve Company of Chicago as Assistant Sales Manager, succeeding George W. Wilson, who resigned.

ROY C. YANTIS

Mr. Yantis has been associated with the Refrigeration Industry for many years, having been with Frigidaire, Gibson Refrigerator Company and was Chief Refrigeration Engineer for Wolverine Tube Division of Detroit, prior to joining the Henry organization. He will have his office at the factory in Chicago.

WARREN H. PARKER DIES

WARREN H. PARKER, President, Hasco, Inc., Greensboro, N. C., died suddenly December 13, 1947 at Greensboro, N. C. Services were held in Greensboro, December 15th. Final services and interment were in Paris, Tenn., December 17th. Mr. Parker is survived by his wife.

Warren H. Parker was born in Paducah, Ky., July 8th, 1900, son of George Adams and Mary Lee Hancock Parker. Mr. Parker established Hasco, Inc. at Greensboro, N. C. in 1931 after having worked for Skinner Mach. Co. and Servel Corp. as refrigeration engineer and special representative.

He became a member of REWA in 1937 and has been active in association activities up to the time of his death. He helped organize Region 4 and served as Chairman of this region for several years. He was elected Director to REWA in 1945 and served on the Board until his untimely death.

UNITED IN NEW HOME

UNITED Commercial Sales Company are now in their home at 233 West 32nd Street, Los Angeles 7, California.

After a very disastrous fire on November 11, 1946, United Commercial Sales operated out of temporary quarters and after a very thorough investigation in an attempt to rent new quarters suitable for their business they decided that in order to render the proper type of service to their trade a building would have to be designed from the ground up in order to fill all of their requirements.

When this decision was reached a very careful study of operating needs was made and given to the architect and the building designed accordingly.

Features designed into this new building include a combination of the self service and counter service plan. The merchandise which is primarily sold by exposure to the eye is arranged on attractive displays in the show room where the customers may serve themselves. The more stable merchandise is arranged in specially designed steel bins back of a 40 ft. counter. All merchandise is placed in these bins in numerical order for the purpose of speed.

United enjoys a large telephone and mail order business and one department is set up for the purpose of handling this part of the business and is housed in a separate office. Clerks are equipped with special type of

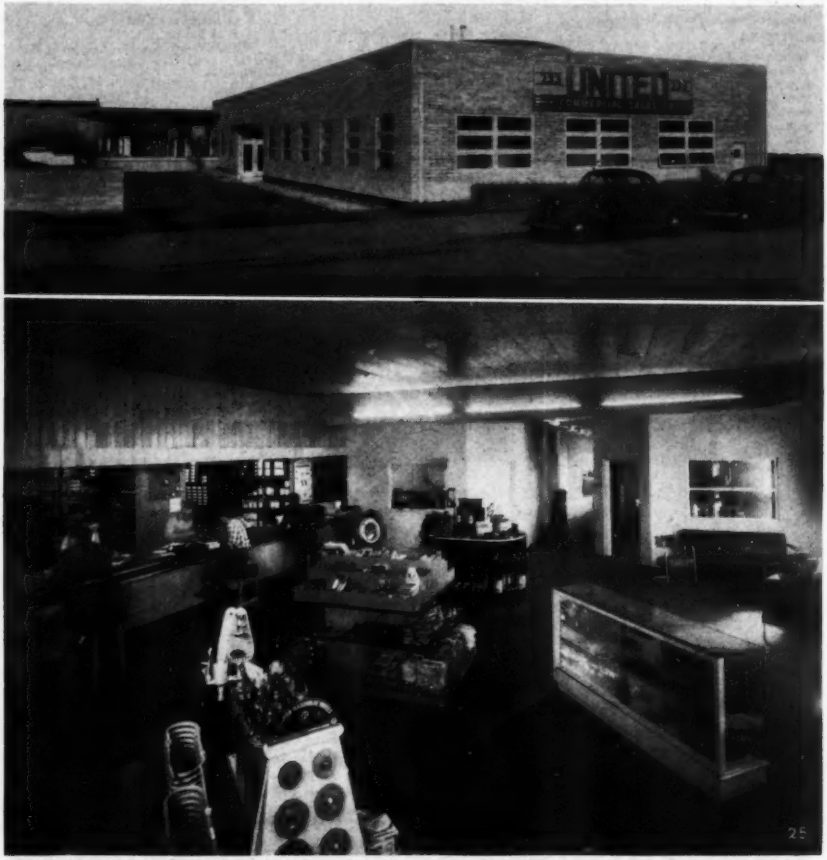
telephones with the idea of giving the fastest and most efficient service possible.

United uses the Kardex system of perpetual inventory in which daily receipts and daily sales are added and subtracted giving them a complete check of inventory and purchasing requirements. This is handled by a separate department and is housed in a separate office.

Their receiving and shipping department is built to truck platform level for convenience of loading. Warehouse space for heavy equipment on this level eliminates the necessity of unnecessary handling of the heavier merchandise such as large condensing units.

A fireproof room for the storing of all refrigerants and other inflammables such as prestolite tanks is included in the building. The company is convinced that if they had had such a storage space for refrigerants their fire would not have been near as disastrous.

One of the problems given consideration was the question of customer parking. They therefore designed their building so that parking would be immediately adjacent on one side and with the main entrance to the display room and counter from the parking lot. About 90 per cent of their counter trade drive in cars or trucks and the usual direct street entrance is eliminated.



Pictured above is the new home of United Commercial Sales Co., Los Angeles, Calif., and an interior view of the modern, spacious sales room and sales counter. A fire in November, 1946, destroyed the original home of the company making it necessary that they occupy temporary quarters until the completion of their new home.

CONSTRUCTION STARTED ON OBERC BUILDING

OCTOBER 24, 1947, marked another milestone in the history of J. M. Oberc, Inc., Michigan's oldest and largest Refrigeration Supply Jobber. On that date, ground breaking ceremonies were held at the sight of their new home, 55 Oakman Blvd., Highland Park 3, Michigan.

The artist's drawing of J. M. Oberc's new building is shown above and in the ground-breaking ceremony (below) are (left to right): A. J. Mattes, Sales Manager, J. M. Oberc, Inc.; Frank Dow, Construction Engineer; J. M. Oberc, President, J. M. Oberc, Inc.; N. J. Patterson, Mayor of Highland Park; Mrs. J. M. Oberc, Vice President, J. M. Oberc, Inc.; Carl Marr, Architect and Construction Superintendent, Marr & Marr; H. F. Campbell, Building Contractor; E. A. Germain, Secretary, J. M. Oberc, Inc.

General contract for construction of this ultra-modern jobbing sales room, offices and warehouse, comprising over 15,000 square feet, has been awarded to Campbell Construction Company of Detroit, and calls for completion about April 6, 1948.

Mr. Oberc states that the foremost consideration in selecting the location and in laying out the building plans was customer convenience. The location is in the approximate center of metropolitan Detroit, and is readily and quickly reached by main thoroughfares from every section of the city and suburbs.

The new building will be completely fireproof and will have many features provided for the convenience and comfort of Oberc customers. The outstanding feature is an assembly hall, seating approximately 125 persons and having kitchen facilities. Mr. Oberc says the assembly hall will be used for sales promotional meetings and will be offered to recognized Refrigeration Associations as a location to hold their regularly scheduled meetings. Additional features include a private office with telephone facilities, for exclusive use by customers, a 70-foot sales counter, modern rest rooms opening off the display floor, a 70 x 20 sales room which will feature displays of refrigerated fixtures, and refrigeration, heating and air conditioning equipment and supplies. Mr. Oberc states that the display floor will be at the disposal of all customers for use as their own sales room where customers may be brought for visual demonstration of fixtures and equipment.

The rear portion of the building will be utilized as a storage area for heavy inventories, and the shipping and receiving departments. Materials will be received and shipped through a double truck well, capable of accommodating two semi-trailers simultaneously. Loading will be accomplished directly from the floor, which will be at truck body level.

Completion of the building in April is anxiously awaited, said Mr. Oberc, since it will permit the housing of all equipment and supplies under one roof, and will eliminate the necessity of using three remote warehouses that have been a part of the Oberc set-up for the past several years. It will also permit the re-establishing of the traditional Oberc policy of providing customers with a complete "One Stop" service for all refrigeration, heating and air conditioning supplies and equipment.

BINDERS OPEN SALES OFFICE

THOMAS W. BINDER and Harold Binder have opened a manufacturers sales representative office in Newark, New Jersey. They will operate under the name of Johns Sales Corporation, and will cover Northern New Jersey and New York State.

Thomas W. Binder has been in the refrigeration industry for the past 25 years. Harold Binder has been connected with the industry for the past 10 years as a wholesaler and manufacturer. He also served 3 years in the Army Signal Corps.

THOMPSON BECOMES DIRECTOR OF SALES FOR KINETIC

KINETIC Chemicals, Inc., announced recently that R. J. Thompson, formerly sales manager—technical, becomes director of sales, succeeding W. W. Rhodes, effective January 1, 1948. Mr. Rhodes is appointed sales manager—aerosol propellants. R. L. Williams has been appointed assistant sales manager—refrigerants.

M. C. TURPIN NAMED SECRETARY OF ASRE

M. C. TURPIN, acting secretary of The American Society of Refrigerating Engineers since June 1947, has been elected Secretary of the Society at its 43rd Annual Meeting in December, it is announced by Clifford F. Holske, president of the Society.

M. C. TURPIN

Mr. Turpin had been sales manager in the merchandising department of Westinghouse Electric Corp., in its Washington office, for 15 years, although he was connected with the company since 1909. He was for many years engaged in the preparation of technical literature and articles for the trade press for Westinghouse, first editor of the company's house organ, president of Electric Institute of Washington, member of the Washington Board of Trade, and also charter member and chairman of the Baltimore-Washington Section of the ASRE.

A native of Richmond, Va., Mr. Turpin was graduated with a degree in electrical engineering from Alabama Polytechnic Institute, and did post graduate work at Cornell University.

Besides his activities as Secretary of the Society, he is also secretary of all ASRE Technical and Standards Committees.

R.S.C. APPOINTS O. B. HERRICK

APPOINTMENT of O. B. Herrick as Wholesale Sales Manager was announced by Warren Farr, president of Refrigeration Sales Corporation.

O. B. HERRICK

Herrick, who has been in the commercial refrigeration sales field for the past nine years in the Northern part of Ohio is a former president of the Refrigeration Contractors Association of Cleveland, a certificate member of R. S. E. S., and an associate member of A. S. R. E.

THOMAS HEADS SCHNACKE SALES DEPARTMENT

IN THE expansion program for 1948 of the sales organization at Schnacke, Inc. of Evansville, Indiana, it was announced by F. C. Schnacke, President, that T. G. (Ted) Thomas has been appointed Sales Manager of the Refrigeration Equipment Division. He replaces Eddy Miller, who resigned to go into his own business.

Thomas had been with the company previously as Division Manager and has had considerable experience in refrigeration sales and engineering as head of his own business in Texas, and is well-known in the industry. He brings to this post a wealth of sound judgment and seasoned experience, needed in today's buyers' market. Production has caught up with sales in this industry and salesmanship is again to be all-important. In line with this thinking Schnacke is planning to greatly enlarge its field selling organization, both with factory sales engineers and live distributor organizations.

Schnacke reports a very successful year for 1947 as the tide changed to a competi-

tive market and has very favorable prospects for 1948. The company began the manufacture of the present compressor line in January, 1946, when it took over the line from another manufacturer. According to F. C. Schnacke the line now comprises com-

Above: T. G. THOMAS and B. MILLER
Below: W. H. HOLLINGSWORTH and G. G. MILLER

pressor units from 5 to 50 h.p., condensing units up to 25 h.p., water-cooled finned tube condensers and evaporative condensers.

Other personnel changes announced include Basil Miller, who formerly was a sales engineer, appointed Division Manager of the North-Central territory. Miller had been with Schnacke about six months and formerly was with Nash-Kelvinator in a similar post, and most recently a consulting engineer in Cleveland. He, too, is well-known in the industry.

William H. Hollingsworth, formerly distributor for Schnacke Refrigeration Equipment in Philadelphia, has been appointed Division Manager in the Northeast territory. Hollingsworth is a registered professional engineer and a veteran colonel in the United States Marine Corps, where he was in charge of important engineering work, much of it low temperature refrigeration and air conditioning. He will make his headquarters in Philadelphia.

George G. Miller, Jr. has joined the Schnacke organization as Sales Engineer in the Southwest territory. He is a highly qualified engineer and was in his own refrigeration business in Kansas just prior to his new post. He will make his headquarters in the territory.

E. M. SMITH HEADS PENN CHICAGO BRANCH

EDWARD M. SMITH has been appointed manager of the Chicago branch office for Penn Electric Switch Co. of Goshen, Indiana, to succeed W. W. Lige, resigned, according to R. H. Luscombe, sales manager.

E. M. SMITH

Smith has been a sales engineer with the Penn organization for the past 10 years, and is well versed in the application of automatic controls for heating, refrigeration, engines, pumps and air compressors. During the last 2½ years, he was manager of the company's Goshen territory. Previously, Smith was manager of Penn's Detroit branch office for approximately 5 years.

The Chicago office of Penn Electric will remain in its present location at 520 N. Michigan Avenue.

NELSON TO REPRESENT KOLD-HOLD

KOLD-HOLD COMPANY, Lansing, Michigan manufacturers of refrigeration products, has named A. J. "Art" Nelson as manufacturer's agent in the Rocky Mountain area.

A. J. NELSON

Nelson, born and educated in Sioux City, Iowa, is thoroughly familiar with Rocky Mountain territory, having traveled extensively there during the nine years following his training at Iowa University and The University of South Dakota. A former Army Air Forces

Captain, he was called to active duty in 1941, and served until the close of the war as a Communications Engineering Officer, handling special assignments on both ground and air-borne radar.

Adoption of the Kold-Hold line marks a forward step for Nelson's own Rocky Mountain business, which has claimed his full time since his return to Army Reserve status in 1945.

NEW REPRESENTATION FOR REMCO

K. M. NEWCUM, president of Remco, Inc., announces the appointment of James E. O'Brien who will represent Remco in Minnesota, South Dakota, North Dakota, Iowa, Eastern Nebraska, Wisconsin, and the upper peninsula of Michigan. Mr. O'Brien replaced Wallace A. Henry, who has entered another phase of the refrigeration industry, the plans of which will be announced in the very near future.

J. E. O'BRIEN

W. L. LEDBETTER

Mr. O'Brien will make his headquarters in the Plymouth Building, Minneapolis. His home is at 3000 Decatur Avenue, St. Louis Park, Minneapolis. He is married, 36 years of age, a veteran of World War II, having had 43 months of service with the Air Forces, most of which time was spent in combat service overseas. Since returning from military service he has been employed as a sales manager by one of the local companies who manufacture brass.

Mr. O'Brien has been working with Mr. Henry for the past several weeks and has become well acquainted with the refrigeration wholesalers and manufacturers in his territory.

It was also announced that W. Leo Ledbetter will represent Remco in the states of Texas, Oklahoma and Louisiana. His headquarters are at 2303 Roanoke Avenue, Dallas 9, Texas.

Mr. Ledbetter attended SMU, majoring in Engineering and Business Administration. In 1935 he began working for the Fedders Manufacturing Co., Dallas Branch, as assistant manager. He was employed in this capacity until 1941, when the branch was discontinued. He then represented Fedders in the Dallas territory until the Army sent him to the Frankford Arsenal in Philadelphia to study the manufacture of ammunition.

When he was released from this service he returned to representing Fedders and others in the Dallas territory.

BELL OF SERVEL NAMED FIELD SALES MANAGER

HARRY F. BELL, former Eastern Manager of the Electric Refrigeration Division of Servel, Inc., Evansville, Indiana has been named Field Sales Manager according to W. J. Aulsebrook, Electric Refrigeration Division Sales Manager of the company. Mr. Bell will move his headquarters from Boston to Evansville in the near future.

HARRY F. BELL

In his new position Mr. Bell will supervise field sales personnel and cooperate with them in handling correspondence and contacts with customers in all sections of the country.

In addition to this appointment Mr. Aulsebrook also named the appointment of Curtis B. Allen as District Manager in the Southeastern states, replacing W. J. McGuire who died on October 17.

Mr. Allen, who has had a number of years experience with commercial and domestic refrigerator distributors in the South will make his headquarters at Atlanta,

Georgia. He is a veteran of World War II and participated in five major battles in the European theater.

Also announced was an expansion of the Application Engineering Department which is under the management of John Zubrod. Don Rentschler, a recent graduate of the United States Naval Academy at Annapolis, Maryland has joined the Application Engineering Staff in order to render better customer service in this phase of the divisions activities.

UNITED IN EXPANSION PROGRAM

THE United Refrigerator Manufacturing Company has been reincorporated as the United Refrigerator Company. Its officers will be announced in the very near future.

The reincorporation was necessitated by the retirement of Mr. J. F. Ganley, President of the Manufacturing Division, who has been in ill health for the past two years. Mr. Leonard Shapiro and Mr. Louis Rosenfeld of Chicago have acquired an interest in the company and will be actively associated with its future management.

Mr. R. S. Wieding, however, will continue as heretofore. The present district managers will carry on under Mr. Wieding and make every effort to meet the needs of their distributors in the future as they have in the past.

The United policy of making the best refrigerators at competitive prices remains unchanged as well as its policy of maintaining the most informal friendly relations with its distributors.

As soon as more manufacturing space becomes available, the labor force will be expanded to meet the backlog of orders on current demand products. At the same time, a proportionate expansion of the office force is certain to occur. No changes in personnel of any kind have been made and none are contemplated.

NEW CATALOGS AND BULLETINS

THE HARRY ALTER CO., Chicago, Illinois, wishes to announce that the greatest and biggest catalog in the history of the company has just been mailed. It is their Spring catalog, Dependabook No. 146. Many new lines including Kenmore highsides, Utica pliers, Simoniz, taps and drills, and hundreds of other news items were

added. If your copy hasn't reached you yet, write for one on your letterhead to the Harry Alter Co., 1728 S. Michigan Ave., Chicago 13, Illinois.

JARROW PRODUCTS, 420 North LaSalle Street, Chicago 10, Illinois. All types of rubber and rubberized fabric door gaskets are illustrated in a new catalog section just issued by Jarrow Products. Complete specifications and prices are shown and a replacement chart identifies the type of gasket used on all the better known makes of refrigerators. Write Jarrow Products Co. for a copy of the catalog.

IMPERIAL BRASS. A wide range of refrigeration valves, fittings, driers, filters, floats, charging and testing equipment, tubing tools and welding and soldering equipment are described in the new 36 page catalog just issued by The Imperial Brass Mfg. Co., 1200 West Harrison St., Chicago.

Among the technical features of the catalog is a page giving data on the use of charging and testing equipment. There are also pages giving complete dimensional data and other information on Imperial Triple-Seal Flared Tube Fittings.

Detailed data is presented on Imperial DiaSeal Valves and Torpedo Driers, and there is a convenient selector chart for picking out tube cutters, flaring tools, benders, pinch-off tools, etc. Other products described include liquid indicators, pulley pullers, charging lines, charging and testing units, etc.

A copy may be obtained by writing to the manufacturer requesting Catalog No. 80.

SOLAR CAPACITOR SALES CORP. A revised line of A-C motor starting electrolytic capacitors and of Superex paper capacitors for capacitor-type motors and power factor improvement of small induction motors, is shown in Catalog Bulletin AC-1 which is now available from Solar Capacitor Sales Corp., 1445 Hudson Blvd., North Bergen, N. J.

All capacitors listed in this bulletin have been designed for extra long life and reliability under exacting service conditions, and are manufactured to comply with the proposed standards for specialty capacitors now being considered by committees of the National Electrical Manufacturers Association.

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A combination UNIT STARTER, ANALYZER, and AMMETER the *Gammeter**, specially designed to start up and test HERMETIC and OPEN TYPE units.

In one compact, portable instrument, only Gammeter gives you—*

- Direct Manual Starting of Unit
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Price **$29.95** includes full instructions on "ADVANCED AMMETER ANALYSIS"

*Pat. Pending

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NEW! "ALCO-FLAME" LEAK DETECTOR

Here it is . . . the new Justrite Leak Detector, Model 1240—designed to burn alcohol. Quickly detects leaks in refrigeration systems using halide gases . . . helps on repair work.

This handy tool is also a soldering iron or a blowtorch. Comes complete with soldering tip and flame reducer. Easily convertible.

It's handled the same as the famous Justrite "Gas-Operated" Leak Detector. Built of the finest materials. Simple construction. Proven design.

The Justrite "Alco-Flame" Leak Detector, Model 1240, is ready for delivery. See your jobber today.

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SHANK ALL-STEEL GAUGE SETS

All-Steel construction. Automatic shut-off of liquid in case of glass breakage. Composition packing rings give long life, no-leak seal.

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Fine PRODUCTS

DESIGN-ENGINEERED FOR RUGGED SERVICE

RAPID Refillable DEHYDRATORS

. . . really dehydrate; balanced dimensions; maximum dispersion area; thorough contact with silica gel. Sturdy, one-piece, leak-proof shell, triple sealed, truly non-collapsible. Removable, large area, finger type screens permit complete cleaning, prevent damage.

YOUR WHOLESALER has Rapid Dehydrators in eight practical sizes: 5 to 200 cu. in.

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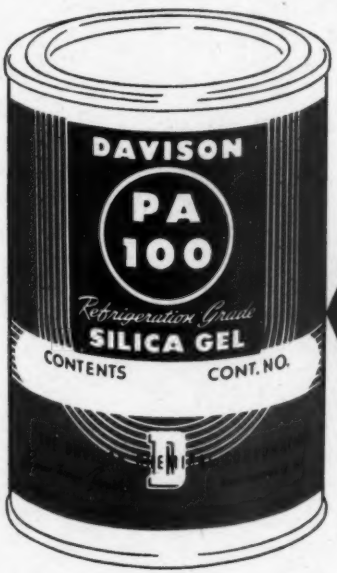

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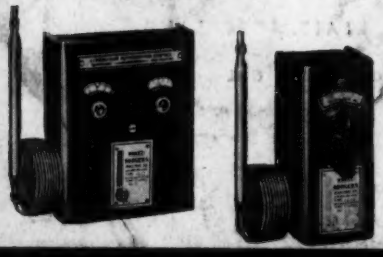

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